Vol. 888 Number 2

SEB

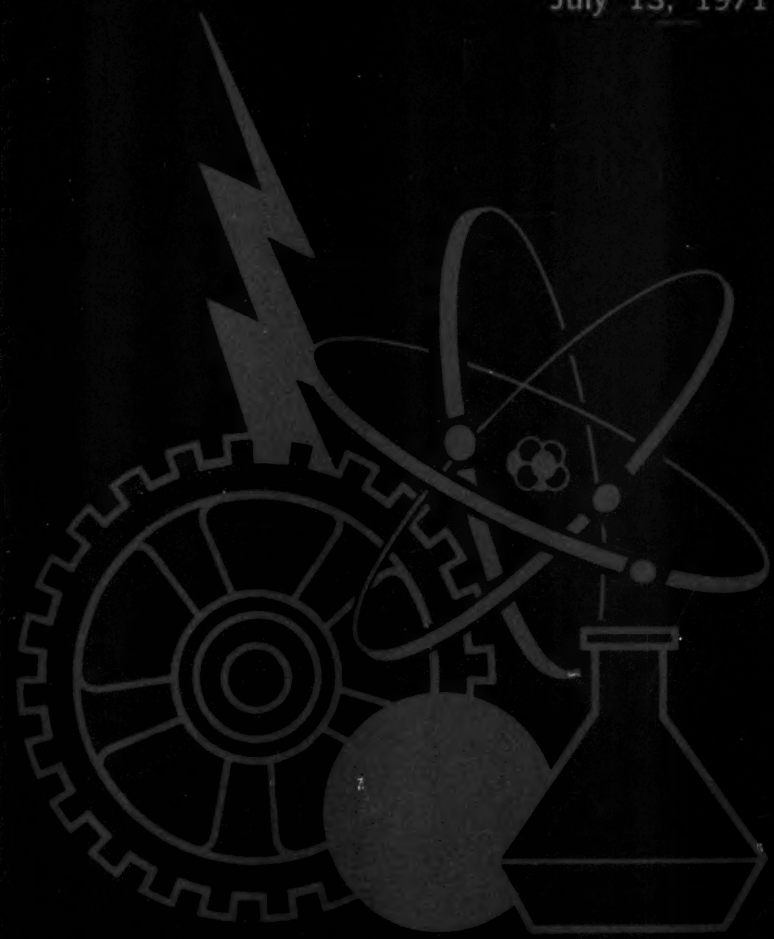
OFFICIAL GAZETTE

of the UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

July 13, 1971



U. S. DEPARTMENT OF COMMERCE

Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

July 13, 1971 Volume 888 Number 2

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PATENT OFFICE NOTICES

Certificates of Correction for the Week of July 13, 1971

Re. 26,559	3,550,651	3,561,871	3,568,860
3,278,685	3,550,659	3,562,184	3,569,812
3,402,032	3,551,353	3,562,302	3,569,933
3,462,994	3,551,366	3,562,359	3,570,054
3,473,605	3,551,514	3,562,544	3,570,793
3,473,644	3,553,036	3,562,577	3,571,773
3,474,356	3,553,318	3,562,910	3,571,817
3,514,700	3,553,926	3,563,241	3,572,175
3,510,194	3,554,611	3,563,426	3,572,202
3,511,168	3,554,791	3,563,460	3,572,485
3,517,285	3,554,939	3,563,514	3,573,227
3,519,624	3,556,062	3,563,660	3,573,318
3,523,097	3,556,318	3,563,772	3,573,374
3,528,038	3,556,322	3,563,958	3,573,477
3,533,067	3,556,897	3,563,991	3,573,492
3,536,736	3,557,178	3,564,256	3,573,527
3,538,074	3,557,872	3,564,275	3,573,719
3,538,730	3,557,919	3,564,348	3,573,942
3,539,646	3,558,472	3,564,489	3,574,174
3,539,784	3,558,615	3,564,967	3,574,185
3,542,765	3,558,712	3,565,123	3,574,236
3,542,790	3,558,944	3,565,244	3,574,518
3,542,802	3,559,688	3,565,651	3,574,650
3,543,858	3,559,735	3,565,944	3,574,892
3,543,882	3,559,774	3,565,955	3,574,910
3,544,709	3,559,803	3,565,975	3,575,135
3,545,214	3,560,199	3,566,060	3,575,151
3,545,675	3,560,528	3,566,328	3,575,173
3,546,443	3,560,537	3,566,843	3,575,482
3,547,646	3,560,598	3,567,333	3,575,685
3,547,852	3,560,649	3,567,770	3,575,780
3,548,076	3,560,991	3,568,044	3,576,686
3,548,830	3,561,409	3,568,255	
3,549,532	3,561,776	3,568,479	
3,549,954	3,561,821	3,568,627	

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 15, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-22-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-01-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-17-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	4-09-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	10-01-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-20-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-01-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-02-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	2-17-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	6-23-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	5-01-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	3-02-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-03-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	7-09-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	3-03-70

Expiration of patents: The patents within the range of numbers indicated below expire during June 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,679,645 to 2,682,657, inclusive
Plant Patents..... Numbers 1,282 to 1,287, inclusive

PATENTS

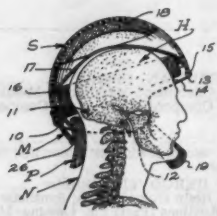
GRANTED JULY 13, 1971

GENERAL AND MECHANICAL

3,591,863
HELMET

Harry E. Rickard, Phoenix, Ariz., assignor to Luzette O. Sparin, Los Angeles, Calif., a part interest

Filed May 19, 1969, Ser. No. 825,542
Int. Cl. A63b 71/10
U.S. Cl. 2—3 7 Claims



The combination of a safety helmet engageable over a wearer's head, a chinstrap fixed to the helmet and engageable with the wearer's chin to maintain the helmet engaged over the wearer's head, an elongate, vertically extending neck pad engageable with the back of the wearer's neck and shaped to conform to the wearer's neck when the wearer's head is tipped and neck is flexed backwardly a predetermined extent and to provide support to the cervical portion of the wearer's spine and occipital portion of the wearer's skull, and mounting means to secure the pad to the helmet and including a hanger fixed to and extending between the pad and the rear portion of the helmet and a pivot bearing carried by the rear portion of the helmet to occur rearward of the pad between the ends thereof and engageable with said pad when the head is tipped back and the lower rear portion of the helmet is moved downwardly and forwardly.

3,591,864
NONFOG GOGGLES

Jon Ivor Allsop, 4314 16th St. #12, Lubbock, Tex.

Filed May 27, 1969, Ser. No. 828,294
Int. Cl. A61f 9/02
U.S. Cl. 2—14 K 1 Claim

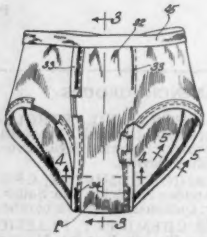
Nonfogging goggles for skiers or the like that includes a pair of spaced apart lenses having a dead air space therebetween and a dehumidifier in the form of a tightly woven wire mesh portion made of a flexible metal of high thermoconductivity.

3,591,865
METHOD OF PRODUCING A BRIEF-TYPE UNDERGARMENT

Karl E. Senser, Riverside, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.

Filed Nov. 5, 1969, Ser. No. 874,260
Int. Cl. A41b 9/02
U.S. Cl. 2—224 2 Claims

A brief for men and boys characterized in that it is formed of substantially a single blank cut from a tubular fabric, one section of tubing disposed between two spaced transverse cuts providing two identical garments. The blank is so cut from such a section as to yield a swatch so shaped that it may

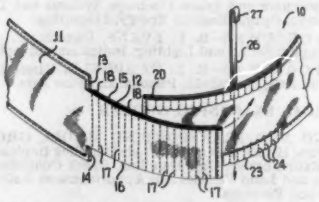


form a supplemental reinforcing seat portion, although not required. The invention consists of the novel garment and also its method of fabrication.

3,591,866
ADJUSTABLE BAND CONNECTION

Lee Jensen, 1402 Manufacturers Road, Chattanooga, Tenn.

Filed Dec. 9, 1969, Ser. No. 883,478
Int. Cl. A41f 9/02
U.S. Cl. 2—321 1 Claim



An adjustable connection for a body-encircling band to permit the band to be adjusted to fit bodies of varying sizes and useful with any type of body-encircling band such as a pelvic belt, girdle or the like. The adjustable ends of the band are provided with a plurality of pockets which are aligned and have a metallic stay extending therethrough to lock the bands together.

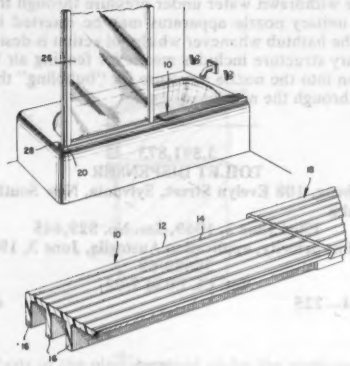
3,591,867
SEAT AND FOOT ADAPTOR FOR TUBS AND SHOWERS

Albert A. Bernstein, 49 Cranberry Street, Brooklyn, N.Y.

Filed Nov. 18, 1969, Ser. No. 877,612
Int. Cl. A47k 17/00
U.S. Cl. 4—1 5 Claims

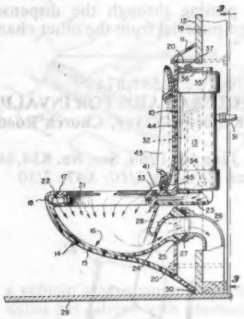
The invention relates to a track cover and is comprised of a flat portion having a plurality of downwardly extending elongated walls running the length of the flat portion. The distance between each of the downwardly extending walls is approximately that distance between the door tracks of a

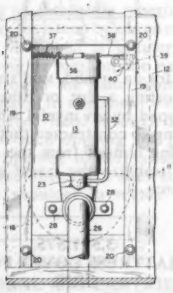
sliding door which is disposed on the upper edges of the bathtub a resilient fastening means may be provided which is



adapted to fit between a downwardly extending leg and a fixed leg on the track of the tub to secure the front portion in position covering the tracks.

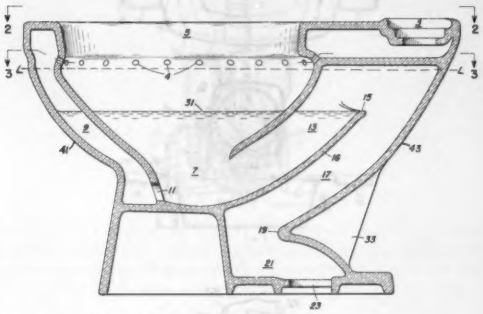
3,591,868
COMMODE STRUCTURE
Walter K. Owens, P.O. Box 5641, Pensacola, Fla.
Filed June 5, 1969, Ser. No. 830,713
Int. Cl. E03d *11/02, 11/18*
U.S. Cl. 4—14 **3 Claims**





A substantially all-plastic commode of simplified construction suitable for boats, homes or commercial installations. The commode is wall-mounted with a very compact pressure flushing tank recessed into the wall behind a shallow housing member. A minimum number of components are employed.

3,591,869
TOILET BOWL (REVERSE TRAP BOWL)
Franklin Keith Manning, New Orleans, La., assignor to American Standard Inc., New York, N.Y.
Filed Mar. 4, 1969, Ser. No. 804,208
Int. Cl. E03d *11/02, 11/18*
U.S. Cl. 4—69 **12 Claims**



Covers a toilet bowl of the reverse trap type which is about one-seventh lighter in weight than other such bowls and may be made by joining only two parts together. The bowl includes jet, up-leg, down-leg and horizontal passageways in which the jet and up-leg passageways are inclined at equal but opposite angles and the up-leg and down-leg passageways are parallel to each other and separated by a thin wall providing the normal weir of the bowl.

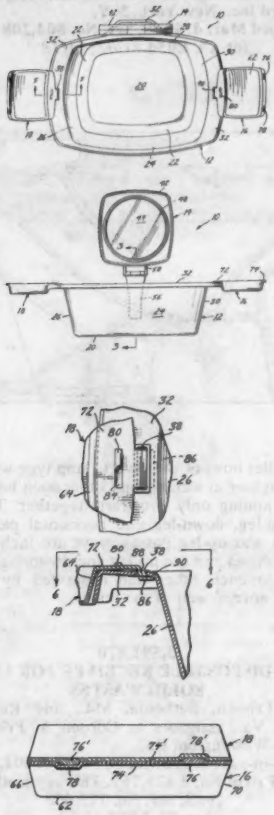
3,591,870
SANITARY DISPOSABLE RECEIVER FOR LIQUID AND SOLID WASTES
Gordon A. Friesen, Bethesda, Md., and Reavis Sproull, Richmond, Va., assignors to Gordon A. Friesen International Inc., Washington, D.C.
Continuation-in-part of application Ser. No. 604,017, Dec. 22, 1966, now Patent No. 3,475,767. This application Nov. 14, 1968, Ser. No. 775,653
Int. Cl. E03d *13/00*
U.S. Cl. 4—110 **29 Claims**

A sanitary disposable receiver for liquid and solid wastes, particularly for human wastes, is disclosed. The receiver is in the form of a sheet capable of being formed into a bag or pouch, which comprises a substrate of unbleached, nonporous, highly hydrated paper, preferably kraft paper, coated on at least one side with a hydrophobic surfactant. A tissue paper outer layer is glued, at its periphery, to the substrate such that an air space is left between two layers. The material of which the pouch is made can be made in sheets, rolls, or ready-formed.

3,591,871
PORTABLE LAVATORY
Herbert A. Segal, c/o Samson Plastics, Inc., 28 Fellowship Road, Cherry Hill, N.J.
Filed Dec. 30, 1969, Ser. No. 889,199
Int. Cl. A47k *1/04*
U.S. Cl. 4—166 **8 Claims**

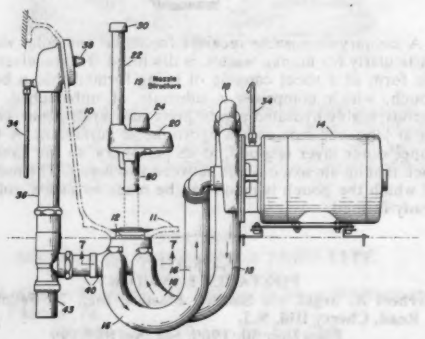
A portable lavatory comprising a free-standing wash basin,

a mirror, a soap dish, and means for removably retaining said



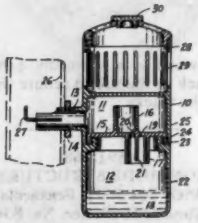
mirror and soap dish on said wash basin.

3,591,872
WHIRLPOOL APPARATUS FOR BATHTUB
Guillermo J. Vanegas, and Byron Martin Veath, both of Louisville, Ky., assignors to American Standard Inc., New York, N.Y.
Filed Jan. 22, 1969, Ser. No. 793,021
Int. Cl. A47k *3/10*
U.S. Cl. 4—178 **14 Claims**



A hydrotherapeutic apparatus for use with a conventional bathtub. The apparatus produces an active whirlpool stream within the bathtub. The apparatus includes a pump, located in a remote point, having a conduit means coupled to the normal drain of the bathtub, for receiving water from the bathtub via the drain, raising the water pressure and for reapplying the withdrawn water under pressure through the same drain. A unitary nozzle apparatus may be inserted into the drain of the bathtub whenever whirlpool action is desired and this unitary structure includes means for feeding air for venturi action into the nozzle structure for "bubbling" the water emitted through the nozzle.

3,591,873
TOILET DISPENSER
Robin Cheng, 108 Evelyn Street, Sylvania, New South Wales, Australia
Filed June 2, 1969, Ser. No. 829,445
Claims priority, application Australia, June 3, 1968, 38689/68
Int. Cl. E03d *9/02*
U.S. Cl. 4—225 **4 Claims**



A toilet dispenser which is connected to a cistern flush pipe for dispensing disinfecting or cleansing material into the liquid passing into the said flush pipe, said dispenser having first and second chambers one of which provides a chamber in which liquid passing through the dispenser collects a charge of dissolved material from the other chamber.

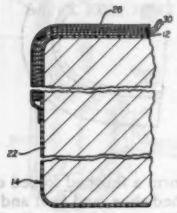
3,591,874
STRUCTURAL AIDS FOR INVALIDS
Niel Anthony O'Kennedy, Vevay, Church Road, Ballybrack, Ireland
Filed June 18, 1969, Ser. No. 834,449
Int. Cl. A61g *7/10*; **A47c** *7/50*
U.S. Cl. 5—81 **9 Claims**

A structural aid for an invalid, said structural aid comprising a frame supporting a bar or other member which is adapted to be gripped by an invalid when in a seated position, the frame being so constructed that the force applied by the invalid in raising himself from the seated to a standing position serves to stabilize the frame against movement in response to said force.

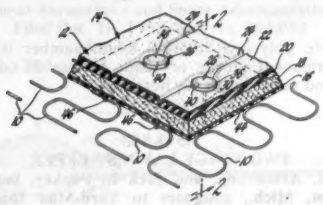
3,591,875
DISPOSABLE MATTRESS COVER FOR BASSINET OR CRIB
Fred W. Zipf, III, and William A. Lutz, both of Rumson, N.J., assignors to Blessings, Inc., Bound Brook, N.J.
Filed Mar. 5, 1969, Ser. No. 804,431
Int. Cl. A47g *9/00*
U.S. Cl. 5—335 **12 Claims**

A mattress cover made of a length of thin waterproof plastic sheet material which covers a bassinet mattress with a

water-pervious sheet across the top of the plastic sheet having edge portions bonded to the plastic. Plies of cellulose wadding may be used between the water-pervious sheet and the plastic to provide additional cushioning and/or absorbency. Parts of the plastic extend under the mattress to hold the cover in place. One modification is tubular for receiving the mattress and another has diagonal slits near the corners of the cover so that the mattress corners can be put through the slits to hold the cover on the mattress.



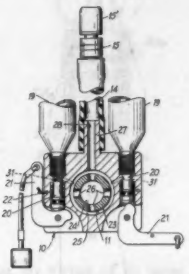
3,591,876
SEAT BUTTON ASSEMBLY
Henry G. Swindlehurst, St. Clair Shores, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 16, 1969, Ser. No. 885,451
Int. Cl. A47c *31/02*
U.S. Cl. 5—356 **6 Claims**



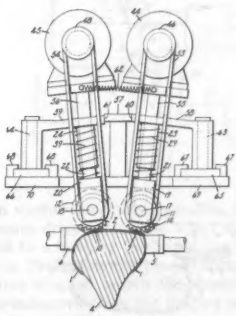
A panel of a vehicle seat is supported on the seat springs and a wire or nylon net coated with plastisol or impregnated in a layer of plastisol is secured to the seat springs underneath the panel. A seat button includes a base and a stem, with the stem having an outwardly tapering head at the free end thereof joined to the stem by an annular shoulder. The largest diameter of the head is greater than the normal diameter of an opening or mesh of the net. The stem of the button is inserted through the panel from any point on the outer surface of the panel in alignment with the extent of the net to force the tapered head through a random selected opening of the net or such opening and plastisol layer. The plastisol returns the opening to normal size and locates the net strands defining the opening or such strands and plastisol layer underlying the shoulder to secure the button to the panel.

3,591,877
COMBINATION ORAL AND CARTRIDGE INFLATOR FOR LIFE PRESERVER VEST
Manfred Schuler, Newport Beach, Calif., assignor to AMF Incorporated, Jersey City, N.J.
Filed July 14, 1969, Ser. No. 841,270
Int. Cl. B63c *9/24*
U.S. Cl. 9—320 **4 Claims**

The oral inflator, pressure relief valve, and multiple individually actuated cartridge inflators are all mounted at a single location on the life preserver vest.



3,591,878
SHOE LASTING MACHINES
Anton Muhlbach, Frankfurt am Main; Gerhard Lauckhardt, Frankfurt am Main, and Rudi Fichtner, Ober Horgern, all of, Germany, assignors to USM Corporation, Boston, Mass.
Filed Dec. 2, 1969, Ser. No. 881,509
Claims priority, application Germany, Dec. 3, 1968, P 18 12 461.3
Int. Cl. A43d *21/00*
U.S. Cl. 12—8.3 **11 Claims**



A shoe lasting machine having a rotary wiper movable lengthwise along the margin of a shoe bottom for progressively wiping an upper margin inwardly over an insole on a last fixed against movement.

3,591,879
METHOD OF ATTACHING INSOLES
Peter L. Stapleton, Leicester, England, assignor to USM Corporation, Flemington, N.J.
Division of Ser. No. 670,598, Sept. 26, 1967. Filed June 13, 1969, Ser. No. 871,223
Int. Cl. A43d *9/00;* **A43b** *13/38*
U.S. Cl. 12—142 **2 Claims**

A novel method of temporarily locating an insole on a last bottom. The insole comprises discrete forepart and heel portions joined by an extensible portion, the forepart and heel portions each having locating holes therein to facilitate posi-

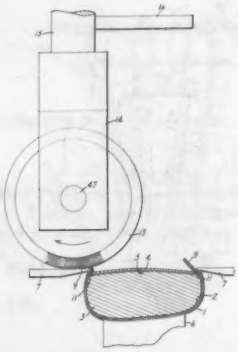
tioning of the insole on the last. Preferably, the forepart and heel portions are joined by means of extensible material such

as polyurethane foam interposed between overlapped margins of the two portions.

3,591,880
SHOE LASTING AND SKIVING MACHINE AND METHOD

Anton Muhlbach, Frankfurt am Main, and Rudi Fichtner, Ober Horgern, both of, Germany, assignors to USM Corporation, Flemington, N.J.

Filed May 27, 1969, Ser. No. 828,237
Claims priority, application Austria, May 31, 1968, A 5261
Int. Cl. A43d *7/00, 29/00*
U.S. Cl. 12—145 **9 Claims**



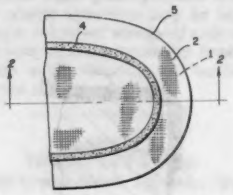
A shoe-lasting machine having a device for skiving the margin of a partially lasted shoe upper supported by wipers in an intermediate supporting and clamping position. The wipers are included in heads which transfer the shoe between a pulling unit and a skiving device.

3,591,881
SHOE UPPER ASSEMBLIES

Raymond Charles White, Soundwell; Ivor Evans, deceased, late of Union Works, and Jose Veronica Evans, administratrix, Cossington, all of, England, assignors to Soundwell Investments Limited, Soundwell, Gloucestershire, England

Filed Nov. 7, 1968, Ser. No. 774,605
Claims priority, application Great Britain, Nov. 10, 1967, 51196/67
Int. Cl. A43d *00/00*
U.S. Cl. 12—146 **13 Claims**

A method of preparing shoe upper assemblies wherein an outer and a lining of a shoe upper assembly are secured together by adhesive, with any reinforcement components which may be required therebetween, a marginal portion of the assembled outer and lining is skived, the skived marginal

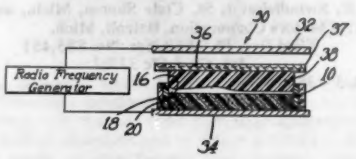


portion is folded to form a finished folded edge, which forms the top line of a finished shoe, and heat and pressure are then applied to the assembly to consolidate the bond between the various constituent parts of the assembly.

3,591,882
CHEMICAL MANUFACTURE

Ralph E. Pearsall, Gloucester, Mass., assignor to USM Corporation, Boston, Mass.

Filed Aug. 21, 1969, Ser. No. 851,796
Int. Cl. A43d *00/00;* **A43b** *13/38*
U.S. Cl. 12—146 **8 Claims**

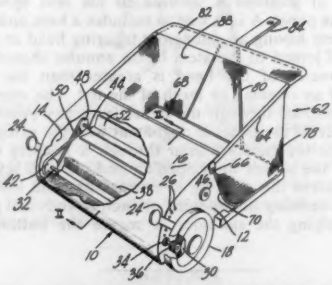


A flexible polyvinyl chloride foam member is provided with a permanent profile or shape by use of compressive pressure and radio frequency heating.

3,591,883
TWO-STAGE LAWN SWEEPER

William H. Armstrong, and Jack L. Ponkey, both of Birmingham, Mich., assignors to Yard-Man Incorporated, Jackson, Mich.

Filed Mar. 10, 1969, Ser. No. 805,584
Int. Cl. E01h *1/04*
U.S. Cl. 15—79 **5 Claims**



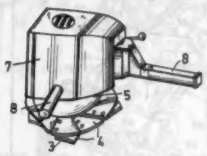
A sweeper of the type commonly known as a lawn sweeper utilizing a rotating pickup brush for removing leaves, grass cuttings and debris from a lawn, and throwing the matter swept from the lawn into an impeller, which in turn transfers the sweepings into a hopper. The resultant dual or two-stage transferral of the sweepings from the lawn to the hopper provides improved operating characteristics and improved distribution of the sweepings within the hopper.

3,591,884

MACHINE FOR POINTING CERAMIC TILES OR THE LIKE SLABS

Richard Grueb, 7061 Schlichten-Schorndorf, Im Bruehl, Germany

Filed May 14, 1969, Ser. No. 824,624
Claims priority, application Germany, July 4, 1968, P 17 84 061.8
Int. Cl. E01c 19/42
U.S. Cl. 15—98 7 Claims



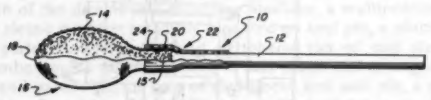
Pointing tiles or the like slabs by means of a machine for pressing a filling material between the tiles, leveling the joining surfaces between the tiles and washing the level surfaces and tiles with wet wood powder; said machine comprising drive means and associated shaft for rotation of a plate at a speed of between 55 and 110 revolutions per minute, the underside of the plate being provided with resilient slanted readily exchangeable steel blades of equal size which are spread evenly over sectorlike areas of the plate and which are completely covered on the side facing the material to be processed with felt or plastics material pads wetted before use and having a thickness of from 5 to 15 mm.

3,591,885

NONCONTAMINATING SWABS

Martin Fritzen, Jr., Northridge, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 16, 1968, Ser. No. 784,055
Int. Cl. H47l 13/16
U.S. Cl. 15—210 3 Claims



An absorbent swab is disclosed which consists of a wad of fibrous material on at least one end of the swab with an envelop or sock of woven porous fabric surrounding and entrapping the wad thereby preventing egress of absorbent material through the fabric. The woven sock is secured to the handle of the swab with a length of heat shrinkable synthetic polymeric material or the sock may be fused to the applicator stick by a heating process.

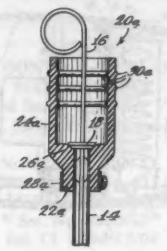
3,591,886

DIP STICK WIPER ATTACHMENT

William J. Denver, 601 Nicholson St., Joliet, Ill.

Filed Mar. 14, 1969, Ser. No. 807,261
Int. Cl. G01f 15/12
U.S. Cl. 15—210 B 5 Claims

A dip stick wiper attachment for the conventional dip stick guide pipe of a liquid reservoir, consisting essentially of a tubular pliant wiper member having a first portion slipped over the upper end of the guide pipe, a cup portion of large internal diameter extending above the pipe and a shoulder between said portions located at approximately the upper end of the pipe, and a hose clamp securing said first portion to the pipe. The pliant cup is manually squeezable into engagement with the dip stick as it is withdrawn from the reservoir to wipe the stick clean, and upon release flexes outwardly to accommodate normal unrestricted subsequent passage of the dip stick through the pipe to and from the reservoir for purposes of liquid level measurement. The pliant cup is always at hand to serve a wiping function and it insures automatic return to the reservoir of the fluid wiped



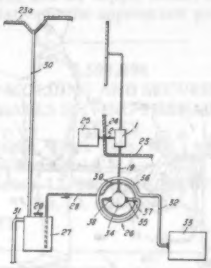
from the stick. Also, by virtue of its large diameter, the cup accommodates the normal appurtenances on the upper end of the dip stick so that no change is required in either the dip stick or the guide pipe originally supplied with the reservoir.

3,591,887

WINDSCREEN WASHER DEVICE

James Edward Keddie, 1 Freelands Road, Bromley, Kent, England

Filed Feb. 13, 1969, Ser. No. 799,006
Int. Cl. A47l 1/02
U.S. Cl. 15—250.02 10 Claims



A windscreen washer assembly including a rotary positive displacement pump driven from the wiper spindle and feeding washing fluid to a washing fluid applying device mounted on the wiper arm. Preferably the blade support is hollow and includes apertures through which the washing fluid can be applied to the windscreen from the leading side of the blade support. conveniently hot or cold water can be applied by manipulation of a selector valve.

3,591,888

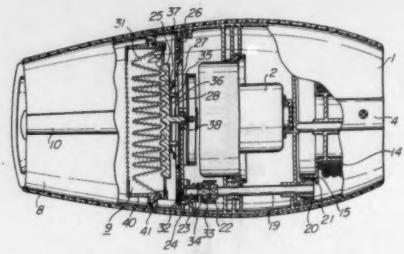
ELECTRICALLY OPERATED VACUUM CLEANER EQUIPPED WITH AUTOMATIC FILTER-CLEANING MEANS

Chuji Takeda, Toyonaka-shi; Katsuo Sawada, Suita-shi; Shigeyuki Asanari, Suita-shi, and Tetsuya Nakamura, Osaka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 22, 1969, Ser. No. 887,055
Claims priority, application Japan, Dec. 27, 1968, Dec. 27, 1968, Dec. 27, 1968, Oct. 24, 1969, Oct. 24, 1969, Oct. 24, 1969, Oct. 24, 1969, Oct. 24, 1969, 43/772; 43/785; 43/787; 44/86673; 44/102709; 44/102710; 44/102711; 44/102712
Int. Cl. A47l 9/20
U.S. Cl. 15—323 10 Claims

An electrically operated vacuum cleaner having automatic filter-cleaning means, said means comprising a filter-cleaning member adapted to be driven by the rotation of cord takeup

means transmitted through power-transmitting means, the movement of the filter-cleaning member being utilized to



apply deflection and impact to the filter for removing dusts therefrom.

3,591,889

MOBILE WALL-, CEILING-, AND FLOOR-WASHING APPARATUS

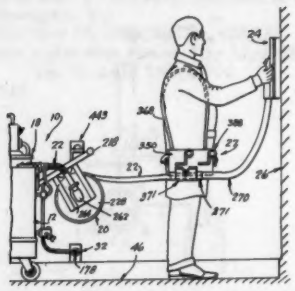
John A. Wisher, 5207 Tilbury Way, Baltimore, Md.

Continuation-in-part of application Ser. No. 560,281, June 24, 1966, now Patent No. 3,464,081.

This application Aug. 29, 1969, Ser. No. 854,209

Int. Cl. A47l *7/00*

U.S. Cl. 15—321 **26 Claims**



Wheel-mounted wall-, ceiling-, and floor-washing apparatus including a frame supporting a plurality of tanks each containing a liquid under pressure, and liquid vacuum cleaning means; a wall-engageable porous cleaning element; conduit means connecting, respectively, each tank and said liquid cleaning means in communication with said wall-engageable means; valve means connected in each conduit means to selectively control fluid flow through the wall-engageable means to a wall to be cleaned and operable to apply suction thereon to remove excess liquids from the wall therethrough.

3,591,890

APPARATUS FOR HEAT SHRINKING TUBING ABOUT OBJECTS

Arnold P. Le Vasseur, Lakeville, and Randolph P. Roen, St. Paul, both of, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

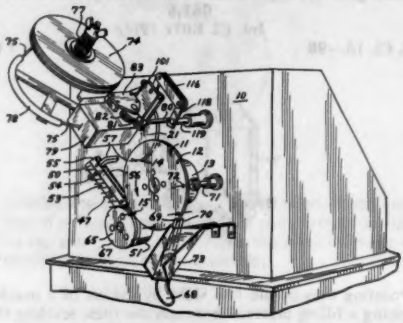
Filed May 2, 1968, Ser. No. 726,184

Int. Cl. B29c *17/00, 27/00*

U.S. Cl. 18—4 R **9 Claims**

A process is taught for fixing shrinkable tubing about objects. The process includes cutting a section from an advanced end of shrinkable tubing, conveying the discrete section sequentially and in spaced and oriented condition to an object-receiving station, inserting an object therein, and shrinking the tube section about the object. Tube section encompassed objects formed by this process are also taught.

Apparatus arrangements are also set forth; and these include an indexing holder assembly of tube section holders, an indexing body assembly of mandrels adapted to receive cut sections of shrinkable tubing and transfer them into tube section holders of the holder assembly, an indexing selector feed



mechanism for conveyance of objects into position for insertion into tube sections hold by the indexing holder assembly, plus means to shrink sections of tubing about objects therein, ;and then means to eject tube-encompassed objects from the indexing holder assembly.

3,591,891

APPARATUS FOR THE PRODUCTION OF PRESSINGS

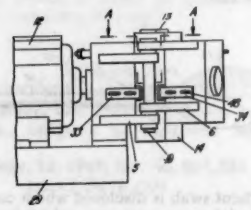
Hans Luhn, Dresden, Germany, assignor to VEB Kombinat Fortschritt, Dresden, Germany

Filed Sept. 23, 1968, Ser. No. 766,016

Claims priority, application Germany, Mar. 25, 1968, WP 12 g/1 31 047

Int. Cl. B92f *3/02;* **B29f** *5/00;* **B02c** *7/10*

U.S. Cl. 18—12 **15 Claims**



An apparatus for the production of pressings from bulk material in powder, piece, swarf or fiber form, in which the bulk material is fed to rotating working elements, wherein two similar disc dies (1, 2) having conical surfaces (15, 16) in the region of a ring are rotatingly mounted by means of shafts (10, 11) opposite to one another in similarly mutually opposite machine bodies (3, 4) in such manner that the axes of the shafts (10, 11) intersect at an obtuse angle, preferably greater than 150°, and the disc dies (1, 2) come into contact with one another on a common generatrix of their conical surfaces (15, 16) and roll on one another on rotation in the same direction, while a feed device (13) and a discharge device (14) are associated with the disc dies (1, 2) and the machine bodies (3, 4) are connected with one another by elements which produce a force-operated engagement.

3,591,892

APPARATUS FOR MAKING NET STRUCTURES

Theodore H. Fairbanks, West Chester, Pa., assignor to FMC Corporation, Philadelphia, Pa.

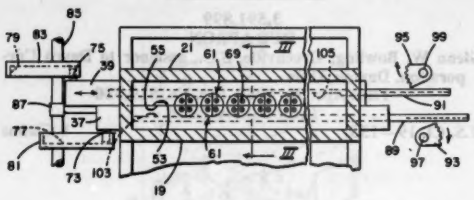
Filed Aug. 12, 1969, Ser. No. 849,805

Int. Cl. B29f *3/06*

U.S. Cl. 18—13 **3 Claims**

Apparatus for making netlike structures in which groups of streams are extruded along opposite sides of a common plane

and are shifted in directions generally parallel to such common plane alternately with the movement of streams from



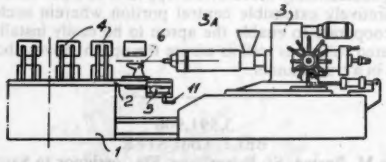
certain of such groups from one side of the common plane to the other thereof.

3,591,893

MOLD-CARRYING APPARATUS FOR MULTISTATION INJECTION-MOLDING MACHINES FOR THE FORMATION OF FOOTWEAR IN GENERAL

Dino Vicini, Milan, Italy, assignor to MAS-Hydraulic and Vulcanizing Co., S.r.l., Milan, Italy

Filed Dec. 16, 1968, Ser. No. 783,903
Claims priority, application Italy, Jan. 30, 1968, 12/60 A/68
Int. Cl. B29h *7/08*
U.S. Cl. 18—4 P **4 Claims**



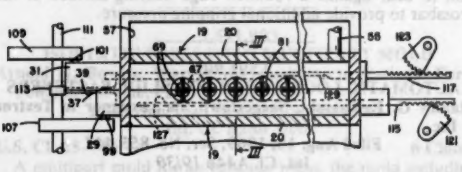
This disclosure relates to a mould-carrying apparatus to be fitted to a multistation injection moulding machine for the moulding or articles of natural or synthetic resin, and particularly for the moulding of footwear, said apparatus comprising a support pin projecting from the front entrance of each of the dies of said moulding machine, a multipositionable sleeve member rotatably mounted on said pin, a plurality of plates fast with the said peripheral rim of said sleeve member, guide means on each of said plates and arranged to extend parallel to the axis of said sleeve and said pin, a plurality of moulds provided with support plates and slide guides, each of said moulds being engaged with one of said plates the arrangement being such that, in at least one of the positions which said sleeve may assume, said plates are in relation with the lower internal horizontal plane of said dies, locking means being provided for releasably locking said support plates with the respective plates secured to said moulds.

3,591,894

APPARATUS FOR MAKING NET STRUCTURES

Theodore H. Fairbanks, Liverpool, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Aug. 12, 1969, Ser. No. 849,947
Int. Cl. B29f *3/06*
U.S. Cl. 18—13 **4 Claims**



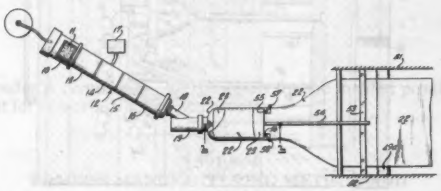
Apparatus for making netlike structures wherein groups of strands of paired groups of strands are periodically shifted to provide different pairs of such groups. Means are also included in such apparatus for rotating each paired group of strands about an axis between the groups of each such pair, with the strands in each such group nearest to such axis being rotated only 180° while the remaining strands on each such group are turned through an angle of at least 360°.

3,591,895

PRECISION CONTROL OF PLASTIC SHEET MANUFACTURE

Thomas M. Britt, Red Bank, and Peter Vanden Basch, Waldwick, both of, N.J., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 682,675, Nov. 13, 1967, which is a Continuation of application Ser. No. 417,332, Dec. 10, 1964, now abandoned. Divided and this application Apr. 11, 1969, Ser. No. 840,871
Int. Cl. B29d *23/04*
U.S. Cl. 18—14 S **9 Claims**



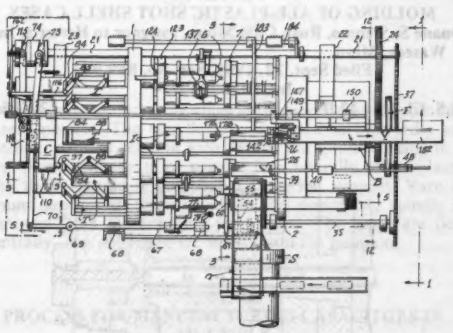
A system for making plastic sheets including a tube extruder and slitting means wherein the extruder is provided with cooling means and air supply means for supporting the extruded tube relative to the appropriate guiding surfaces.

3,591,896

MACHINE FOR MOLDING AND SECURING ON PLASTIC TUBES END WALLS HAVING THREADED-CLOSURE NECKS

Richard A. Tartaglia, Essex Fells, N.J., assignor to Peerless Tube Company, Bloomfield, N.J.

Filed Nov. 12, 1969, Ser. No. 875,972
Int. Cl. B29c *17/00*
U.S. Cl. 18—19 TE **15 Claims**



At one station a mandrel carried by a turret has slid thereon a preformed thermoplastic tube; at another station a slug is die-cut from a strip of heat-softened thermoplastic material and simultaneously pressed into one end of said performed tube; at another station at cavity die on the turret is moved laterally into alignment with a die on said mandrel and the soft slug is molded between the dies under constantly applied pressure generated by a locked toggle and spring combination to form an end wall for said tube having an exteriorly screw-threaded neck; at another station the toggle is unlocked and the mandrel die is withdrawn while said tube is held in the cavity die; at another station the mandrel is auto-

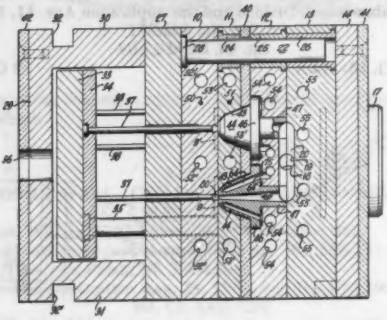
matically rotated with the completed tube thereon to unscrew the neck from the second-mentioned die, and finally the tube is pulled automatically off the mandrel.

3,591,897

RUNNERLESS MOLD FOR AUTOMATED INJECTION-MOLDING OF THERMOSET MATERIALS

Henry A. Perras, Easthampton, Mass., assignor to Osley & Whitney, Inc., Westfield, Mass.

Filed Nov. 1, 1968, Ser. No. 772,773
Int. Cl. B29f *1/08*
U.S. Cl. 18—30 HM **13 Claims**



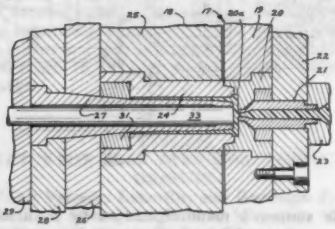
The invention contemplates a mold system primarily useful for thermoset plastics, in the context of producing multiple parts with injection-molding machines, The mold comprises mechanically separable parts or subassemblies for purposes of opening and closing the mold; the mold also comprises thermodynamically isolated regions or zones whereby curing heat is supplied to the mechanically separable parts which define the mold cavity, and cooling or lesser heat is provided for the sprue and runner system to assure non-curing conditions for injected plastic that has yet to reach the cavity regions. The sprue-and-runner-system includes a specially cooled secondary sprue associated with each independent mold cavity.

3,591,898

MOLDING OF ALL-PLASTIC SHOT SHELL CASES

Duane S. Stenmo, Rush City, Minn., assignor to Herter's, Inc., Waseca, Minn.

Filed Sept. 22, 1969, Ser. No. 859,943
Int. Cl. B29c *1/14*
U.S. Cl. 18—42 D **2 Claims**



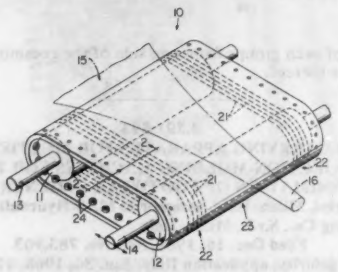
The molding of all-plastic shot shell cases wherein the case has a base wall with substantially smooth inside and outside surfaces and the case sidewall which has a smooth interior surface and a smooth or striated or slightly corrugated outer surface is integral therewith; gating the plastic into the mold at the center of the base wall and causing the plastic to flow first to all portions of the periphery of the base wall and then progressively along all portions of the longitudinal case sidewall, the mold ejecting the case by a sleeve bearing against the open end of the case sidewall to loosen the case from the mold core and an ejector pin within the core completing ejection of the case from the cavity.

3,591,899

RUB APRON

Glenn W. Bowling, Greenville, S.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Apr. 28, 1969, Ser. No. 819,580
Int. Cl. D01g *15/66*
U.S. Cl. 19—153 **8 Claims**



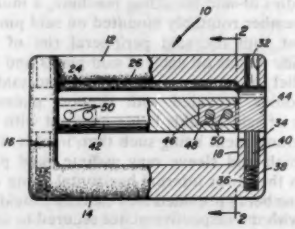
A substantially tubular rub apron for textile machines comprising substantially inextensible opposed end portions and a comparatively extensible central portion wherein such portions cooperate to enable the apron to be easily installed on associated rollers as well as assure the apron moves about its rollers in a true manner.

3,591,900

BELT ADJUSTER

George M. Brown, St. Petersburg, Fla., assignor to Sauna International, Inc., Miami, Fla.

Filed June 30, 1969, Ser. No. 837,393
Int. Cl. A44b *11/10, 11/16*
U.S. Cl. 24—196 **3 Claims**



A belt adjuster provided with spaced parallel, offset fixed bars. A third reciprocating bar is disposed between the fixed bars and cooperates with one of the fixed bars to grip therebetween a looped end portion of a belt. The cooperating bars are purposely of noncomplimentary geometries to provide at least two lines of applied gripping pressure. The other of said fixed bars is offset with respect to the cooperating bars so that a moment of forces urges the looped end portion to bear against a rounded edge bearing surface of the crossbar to provide additional gripping pressure.

3,591,901

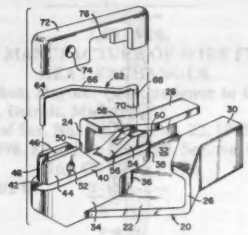
AUTOMATIC LOCK SLIDER FOR SLIDE FASTENERS

Stanley G. Kedzierski, Saegertown, Pa., assignor to Textron Inc.

Filed Aug. 18, 1969, Ser. No. 855,447
Int. Cl. A44b *19/30*
U.S. Cl. 24—205.14 **13 Claims**

An automatic lock slider for a slide fastener including a slider body slidably mounted upon the fastener, a pull tab on the slider, and a wire spring locking member held in a pair of

grooves upon the slider body and biased to an operative position whereby the slider is automatically locked against move-



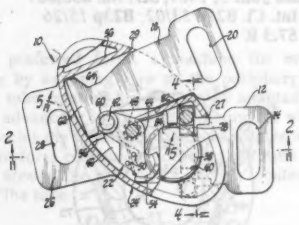
ment along the fastener and is easily released by the application of a pulling force to the pull tab.

3,591,902

TWO-TONGUE BUCKLE ASSEMBLY

Thomas E. Lohr, Warren, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 18, 1969, Ser. No. 886,306
Int. Cl. A44b *19/00;* **B60r** *21/10*
U.S. Cl. 24—205.17 **17 Claims**



A two-tongue buckle assembly including a housing into which first and second tongues may be inserted. A first latch means including an elongated latch bar is biased upwardly by a spring toward the latched position and is movable downwardly by a pushbutton to the unlatched position to coact with the first tongue when inserted thereinto to retain the first tongue in the latched position. A second latch means is included and comprising a support member rotatably connected to the housing and having an arcuate upturned flange on one end for abutting engagement with the first tongue and having a movable latch member supported by a resilient leaf spring at the other end. The resiliently supported latch member is moved by the support member into the path of the second tongue by the first tongue being inserted into the housing and engaging the upturned flange of the support member to rotate the support member so that the latch member movably supported thereon is in the path of the second tongue for latching engagement therewith. The second tongue is therefore retained in the latched position only when the first tongue is inserted into the housing and into the latched position.

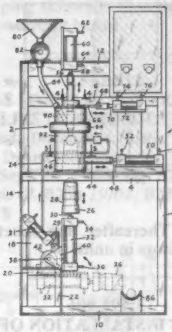
3,591,903

ISOSTATIC PRESS WITH MULTIPART MOLD

Arnold G. Bowles, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Filed Oct. 15, 1969, Ser. No. 866,513
Int. Cl. B28b *3/00*
U.S. Cl. 25—45 **6 Claims**

A multipart mold for an isostatic press, the mold including an elastomeric container having a cavity for receiving a powder to be isostatically compressed, the container having a first part mounted in fixed position in a fluid pressure chamber, a second part extending through the container to the cavity which, when removed, forms a passage for the powder to be compressed, and a third part which, when the



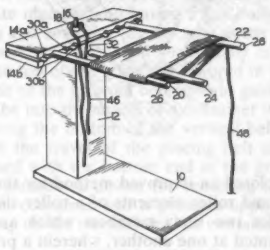
powder is compressed, for a support for the molded powder and for removing the molded article.

3,591,904

POMPON MANUFACTURING METHOD AND APPARATUS

Victor Rosene, 6720 N. E. Roselawn Ave., Portland, Oreg.

Filed June 30, 1969, Ser. No. 837,399
Int. Cl. D04d *7/06*
U.S. Cl. 28—2 **3 Claims**



Pompon manufacturing apparatus comprises a support and three spindles. The spindles are mounted in outwardly extending, parallel relation with two of the spindles being in a first plane and the third spindle in a laterally offset plane. The third spindle is detachable from the support. Yarn is wound around all three spindles. The detachable spindle is removed from the resulting yarn loops. The loops are tied centrally. The ends then are cut to form the pompon.

3,591,905

PROCESS FOR MANUFACTURING CAPACITORS IN MULTIPLE

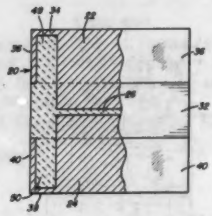
Gilbert James Elderbaum, 3381-A 7th Ave., San Diego, Calif.

Filed June 13, 1969, Ser. No. 832,963
Int. Cl. H01g *13/00*
U.S. Cl. 29—25.42 **10 Claims**

The process consists in applying electric current conducting material to the sides of a sheet of dielectric material, at least one side being provided with a plurality of recesses juxtaposed, but isolated, from the conducting material on the other side.

The process further consists in employing a fluid containing the electric current conducting material, an ingredient which adheres to the dielectric material and to the conducting material when heated, and including a combustible carrier. After the fluid is applied to the opposite sides of the

dielectric sheet, the assembly is subjected to heat to oxidize the combustible carrier and cause the conducting material to



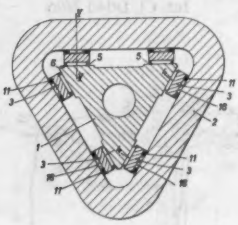
adhere to the sheet. Thereafter, the sheet is severed in a manner to form capacitors in units.

3,591,906

METHOD FOR THE INSTALLATION OF GUIDE RAILS AND ROLLER ELEMENTS OF A ROLLER SLIDING BEARING ARRANGEMENT

Hans-Jurgen Leiber, Tramelan, Switzerland, assignor to Kummer freres S. A. Fabrique de machines, Tramelan Canton of Berne, Switzerland

Filed June 24, 1969, Ser. No. 836,096
Claims priority, application Switzerland, Aug. 29, 1968, 12,930/68
Int. Cl. B23p *11/00*
U.S. Cl. 29—148.4 A **8 Claims**



There is disclosed an improved method for the installation of guide rails and roller elements of a roller sliding bearing arrangement for two body members which are to be displaceably mounted at one another, wherein a predetermined preloading is to be provided for such roller elements, and wherein both of the body members are temporarily fixedly retained with the aid of a mounting device in a desired position with respect to one another. The inventive method contemplates the formation of a hollow space which is closed throughout its entire periphery between each guide rail and the neighboring portion of one of the body members. The dimension of the space between the contact surface of each guide rail and the oppositely situated contact surface of the other of the body members is adjusted, while taking into account the diameter of the roller elements to be used and the desired preloading to which said roller elements should be subjected during operation. Thereafter, each hollow space is filled with a suitable casting resin, with the body members and guide rails thusly adjusted. The casting resin is then permitted to harden and after having hardened, the roller elements are inserted.

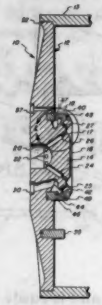
3,591,907

SHRINK FIT FABRICATION METHOD FOR FLUID INJECTORS

James L. MacMunn, Canoga Park, Calif., assignor to North American Rockwell Corporation

Division of Ser. No. 584,214, Oct. 4, 1966, Pat. No. 3,508,712. Filed Apr. 9, 1969, Ser. No. 828,410
Int. Cl. B23p *15/26*
U.S. Cl. 29—157 C **2 Claims**

A method for fabricating a fluid injector having a circular boss containing fluid exit passageways extending from a main body, comprising providing an annular peripheral groove on the boss, shrink-fitting a ring by thermal steps on the boss



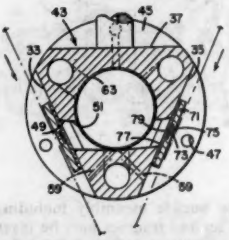
peripheral surface outwardly from the annular groove and bridging the groove, thus forming a fluidtight manifold therewith in communication with the exit passageways.

3,591,908

METHOD OF MAKING SHEET MATERIAL HEATING AND HUMIDIFYING DEVICE

Carl R. Pepmeier, Fredericksburg, Va., assignor to FMC Corporation, Philadelphia, Pa.

Filed June 5, 1969, Ser. No. 830,667
Int. Cl. B21d *53/02*; B23p *15/26*
U.S. Cl. 29—157.3 R **1 Claim**



A method of making a steam chest for use in a laminating apparatus for concomitantly heating and humidifying traveling sheet materials immediately prior to laminating of the same.

3,591,909

METHOD OF MAKING COMPOSITE DRIVE WHEEL

John Bebbington, Jr., and Edward Cozzarin, both of Ithaca, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 678,832, Oct. 30, 1967, Pat. No. 3,469,465. Filed Apr. 2, 1969, Ser. No. 840,865
Int. Cl. B21d *53/28*; B21h *5/00*; B21k *1/30*; B23p *15/14*; B29d *15/00*
U.S. Cl. 29—159.2 **2 Claims**

Composite sprocket and drive wheel devices are disclosed herein to provide illustrations of this invention. These wheels

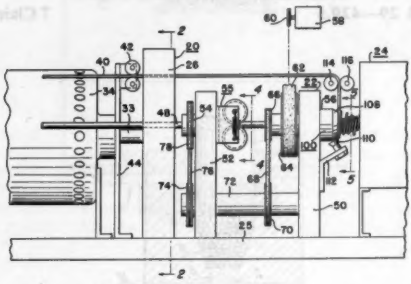
include a circular plate body which is stamped and provided with radially extending segments along the periphery thereof. The segments are formed into tooth roots and a plastic toothed rim is molded thereover.

3,591,910

METHOD OF MANUFACTURE OF WIRE FIN AND TUBE HEAT EXCHANGER

Byron L. Brucken, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 501,991, Oct. 22, 1965, Pat. No. 3,482,298. Filed Oct. 22, 1969, Ser. No. 868,516
Int. Cl. B23p *15/16*
U.S. Cl. 29—202 D 6 Claims



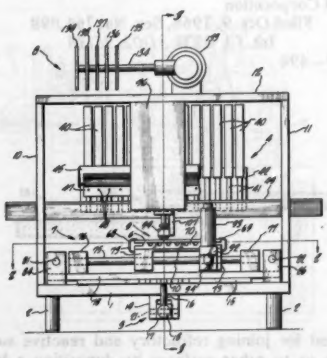
In the preferred form, a machine for making a heat exchanger by wrapping wire on the periphery of a tube including a tube-rotating head assembly adapted to rotate the tube and advance it in an axial direction. A winding spindle head encircles the advancing tube and rotates with respect to the tube to form continuous loops on the tube having a portion bent around the tube and a portion located radially outwardly of the tube.

3,591,911

MACHINE AND METHOD FOR MOUNTING ELECTRICAL COMPONENTS ON A PRINTED CIRCUIT BOARD

Sandor Goldschmied, Anaheim, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of application Ser. No. 589,071, Oct. 24, 1969, now abandoned. This application July 14, 1969, Ser. No. 863,397
Int. Cl. H05k *13/04, 3/30*
U.S. Cl. 29—203 44 Claims



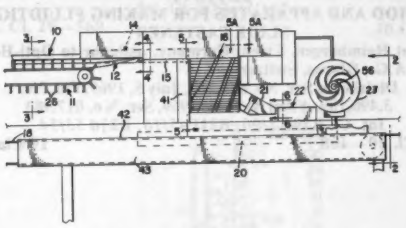
A machine and method are disclosed for inserting the leads of electrical components through holes in a printed circuit board. Included in the machine are assemblies for selecting one of a variety of different kinds of components and selecting the location on the circuit board at which the selected component leads are to be inserted. Preparatory to insertion, the leads of the selected component are straightened, cut, and chamfered on a component block assembly. The circuit board is mounted on a backplate having longitudinal grooves with inwardly sloping sidewalls that bend the leads after insertion through the circuit board.

3,591,912

APPARATUS FOR PLACING AEROSOL VALVE ASSEMBLIES IN AEROSOL CONTAINERS

George E. Leonard, Davenport, Iowa, assignor to The Kartridge Pak Co., Davenport, Iowa

Filed Sept. 26, 1968, Ser. No. 762,780
Int. Cl. B23p *19/04;* B23q *7/00*
U.S. Cl. 29—208 B 13 Claims



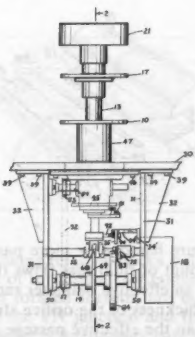
An apparatus for placing aerosol valve assemblies into aerosol containers which comprises mechanism for feeding aerosol valve assemblies which are mounted in closure caps to a placing head with the assemblies properly spaced and the dip tubes brought into downwardly extending relation relative to the closure caps, the placing head comprising a beltlike endless conveyor arranged with a run thereof traveling in a vertical plane closely adjacent to a vertically disposed plate member and having a generally spiral groove for receiving and confining the dip tube as the cap portion of the valve assembly is advanced horizontally in a guide channel across the top of the plate and lowered in a vertical path along the side of the grooved belt so as to guide the free end of the dip tube into the mouth of a container which has been advanced along the bottom of the vertical belt run in timed relation with the travel of the placing belt and the mouth thereof aligned with the bottom end of the groove. The apparatus also includes a device for centering the cap on the mouth of the container and a pressure-applying wheel for seating the cap on the rim defining the container mouth.

3,591,913

RECIPROCATING AND OSCILLATING TOOLPLATE MACHINE

James W. Lewis, 410 Pasadena Drive, Erie, Pa.

Filed Nov. 14, 1968, Ser. No. 775,713
Int. Cl. B23p *19/04;* B23q *7/10*
U.S. Cl. 29—208 14 Claims



A machine for handling articles of manufacture such as small components at high rates of speed. The machine has an

indexing plate, a fixed plate, and a moving plate that oscillates horizontally and reciprocates vertically. The several plates are supported on a cabinet housing which contains the index mechanism and the oscillating-reciprocating mechanism, placement heads, probes and other devices may be supported on the oscillating plate. The fixed plate may carry receptacles to receive articles from suitable feeders. The articles may move from the receptacles by the placement heads or other devices to fixtures supported on the indexing plate. Parts are fed into the machine to stationary tracks supported on the fixed plate, picked up by placement heads, oscillated to position over the fixtures and loaded vertically. The several plates are supported on a column. A raceway supported on the column in which electrical power, air and vacuum may be supplied to the machine.

3,591,914

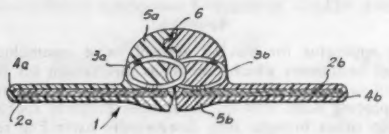
METHOD AND APPARATUS FOR MAKING FLUIDTIGHT SLIDE FASTENER

Helmut Heimberger, Essen, Germany, assignor to Opti-Holding A.G., Glarus, Switzerland

Division of Ser. No. 651,269, July 5, 1969, Pat. No. 3,490,109. Filed Apr. 21, 1969, Ser. No. 817,983

Int. Cl. B29d *5/00*; **B21f** *45/18*; **B21d** *53/54*

U.S. Cl. 29—408 **10 Claims**



A method and apparatus for making a slide fastener whose halves consist of continuous filaments, of helicoidal or meandering configuration, by extrusion of a sealing material about the interlocked coupling elements so that they are almost completely imbedded in respective sealing strips of elastomeric material which meet in the plane of symmetry of the fastener and are provided with complementary elongated formations extending over the full length of each strip, these formations yieldably interlocking upon closure of the fastener and being also in mating engagement with a projection and recess, respectively, of an associated slider.

3,591,915

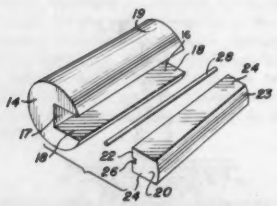
METHOD OF MAKING ORIFICE STRUCTURE

John A. Roberts, North Chelmsford; Peter R. Roberts, Groton, and Lee B. Danzey, Canton, all of, Mass., assignors to Brunswick Corporation

Filed May 12, 1969, Ser. No. 823,823

Int. Cl. B23p *17/00*

U.S. Cl. 29—417 **26 Claims**



An orifice structure has one or more passages capable of controlling the amount of fluid that flows therethrough with the passage having an effective diameter ranging from 5 mils to 1 micron. The thickness of the orifice structure is at least 10 times greater than the effective passage diameter and the wall thickness of the structure is at least 5 times greater than the effective passage diameter. A general method of providing the orifice structure is to constrictively reduce the cross section of two or more material portions with a sacrificial element inserted therebetween which is also reduced in cross section. During constriction the portions are integrated into a homogenous material. After constriction the structure is cut to preselected lengths and shapes and the sacrificial element is removed therefrom. When two or more sacrificial elements are used in a parallel relationship then two or more parallel passages can be provided.

3,591,916

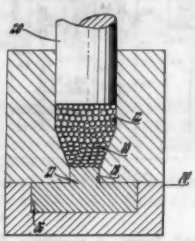
LOW ENERGY FORMING OF METALS

James T. Arthur, Harper Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1969, Ser. No. 853,769

Int. Cl. B22f *3/24*

U.S. Cl. 29—420.5 **7 Claims**



A method of forming bulk metallic articles with relatively little energy input is disclosed. A molten solution of a metal alloy conditionable to exhibit enhanced plasticity is quenched in a manner and at a rate effective to produce pellets having a nonequilibrium, uniform cast structure which on mechanical working bond together and recrystallize to form a homogeneous mass having a fine grain structure required for enhanced plasticity. The mass is then formed at a temperature immediately below the phase transformation temperature of the alloy with relatively little energy input into an article of predetermined configuration.

3,591,917

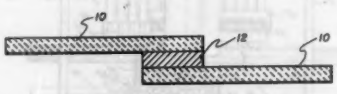
PROCESS FOR JOINING SURFACES

Chester S. Shira, Canoga Park, and Ralph E. Nugent, Santa Susana, both of, Calif., assignors to North American Rockwell Corporation

Filed Oct. 9, 1968, Ser. No. 766,098

Int. Cl. B23k *31/02, 35/38*

U.S. Cl. 29—494 **7 Claims**



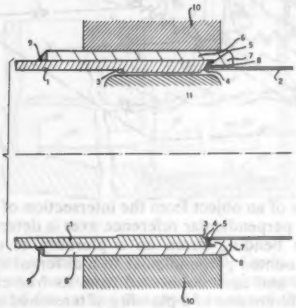
A method for joining refractory and reactive surfaces to themselves or to other surfaces by depositing a layer of a titanium-indium alloy between the joinable surface, and heating under vacuum to evaporate the indium to leave a layer of titanium joining the surfaces. Also, a method for joining the surfaces with the alloy by resistance bonding of said surfaces.

3,591,918

METHOD OF PRODUCING A SEALING TIGHT JOINT BETWEEN TWO TUBES MADE OF DIFFERENT MATERIALS, AND JOINT PRODUCED BY THE METHOD

Jean-Andre Bernard, Barga, and Adamo-Renato Faraoni, Ranco, both of, Italy, assignors to European Atomic Energy Community, Euratom, Brussels, Belgium

Filed Apr. 5, 1968, Ser. No. 719,066
Claims priority, application Belgium, Apr. 19, 1967, 42549
Int. Cl. B21d *39/04*; B23p *11/02, 19/04*
U.S. Cl. 29—516 4 Claims



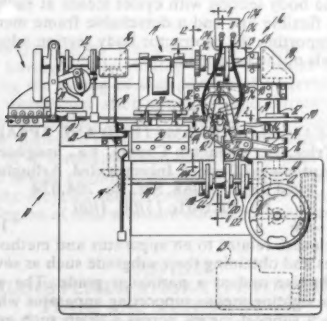
A method of producing a sealing tight joint between two tubes one of which has a greater wall thickness than the other. The thinner tube has a collar formed on it which will engage a circumferential groove in the end of the thicker tube when placed in end-to-end relationship. A sleeve is slid over the two tubes, this sleeve having an inwardly extending flange which engages the collar and holds it near the end of the thicker tube. After welding the collar in place, the thicker tube is worked so as to expand it axially so that the grooved end tightly engages the collar.

3,591,919

FOUR-SLIDE MACHINE WITH THREE REAR MOTION DEVICES FOR PRODUCING BEARINGS AND THE LIKE

Erman V. Cavagnero, Torrington, Conn., and Joseph F. Loftus, Springfield, Ohio, assignors to Torin Corporation, Torrington, Conn.

Division of Ser. No. 721,672, Apr. 16, 1968. Filed June 8, 1970, Ser. No. 44,472
Int. Cl. B21d *9/05*; B21l *3/00*
U.S. Cl. 29—564 9 Claims



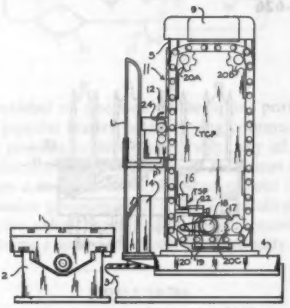
A high-production machine of the vertical four-slide type for intermittently advancing strip stock, severing blanks therefrom, forming the same into bearing races and welding end portions thereof together. The machine has a projecting horizontal mandrel with three work stations therealong respectively for preforming, forming, and preheating and/or welding. A cutoff anvil, transfer pins, broaching tools, and an expandable mandrel section are provided all with rear motion drive action and a welding mechanism is adapted for both preheat and weld operation adjacent the expandable mandrel section. A bearing race discharge track extends from the welding station to an induction furnace.

3,591,920

TOOL CHANGE MECHANISM WITH MAGAZINE POSITIONING MEANS

Wallace E. Brainard, New Berlin, and Erich F. Drechsler, Milwaukee, both of, Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Aug. 13, 1968, Ser. No. 752,242
Int. Cl. B23q *3/157*
U.S. Cl. 29—568 10 Claims



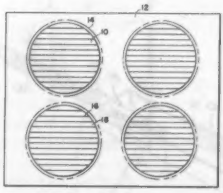
A magazine for storing heavy tools fixedly mounted at the rear of an automatic tape control machine tool, having means for the tape control of selected tools and the presentation of each selected tool to the vicinity of the vertically movable toolhead wherever it has stopped after one cycle of machining operation, and a simple unitarily moving tool changer for receiving the selected tool at the rear of the machine tool, carrying it to the front of the machine tool and exchanging it for the tool in the spindle that is projecting from the front of the machine tool incident to another cycle of machining operation.

3,591,921

METHOD FOR MAKING RECTIFIER STACKS

David F. Cosper, Dallas, Tex., assignor to Varo Inc.

Filed Sept. 30, 1968, Ser. No. 763,787
Int. Cl. B01j *17/00*; H01l *7/66*
U.S. Cl. 29—583 5 Claims



A method for making rectifier stacks is disclosed wherein a plurality of wafers of semiconductor material, each of which has a PN junction formed therein, are bonded together to form a stack with the PN junction and the wafers substantially parallel. Parallel, spaced-apart cuts are made through the stack substantially normal to the PN junctions of the wafers dividing the stack into a plurality of slices, each of

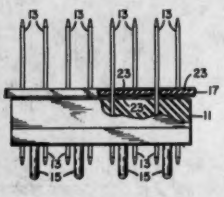
which has a plurality of substantially parallel series-connected PN junctions therein. Each slice is mounted on a mounting plate and parallel cuts are made through each of the slices substantially normal to the PN junctions cutting each slice into a plurality of stacks of die of the desired junction area. Electrical connection is then made to each end of the stack of die to form a rectifier stack which provides an equivalent function to a group of series-connected individual rectifiers.

3,591,922

FABRICATION OF ELECTRICAL SOLDER JOINTS USING ELECTRODEPOSITED SOLDER

Munson H. Pardee, Clinton; Richard D. Turi, Utica; Richard L. Butler, Richfield Springs, and Edward C. Zacaroli, Utica, all of, N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 5, 1968, Ser. No. 781,455
Int. Cl. H05k *3/30*
U.S. Cl. 29—626 **4 Claims**



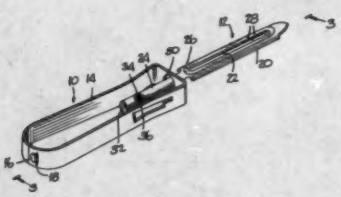
The present device provides a common-connection element such as a bus bar whereupon solder has been electrodeposited and which has been formed to fit over backboard wiring prongs in such a fashion as to come in contact with certain of said prongs. The combination of the bus bar and the backboard wiring prongs is then heated to a point that the solder melts and the prongs become sufficiently hot to draw the solder, or cause a capillary action between the melted solder on the common-connection element and the prongs, thereby causing the solder to build fillets around each of the respective prongs coming in contact with the common-connection element.

3,591,923

HANDLE ATTACHMENT

Robert J. Rose, Harwinton, Conn., assignor to The Turner & Seymour Mfg. Co., Torrington, Conn.

Filed July 31, 1968, Ser. No. 749,196
Int. Cl. B25g *3/12*
U.S. Cl. 30—340 **7 Claims**



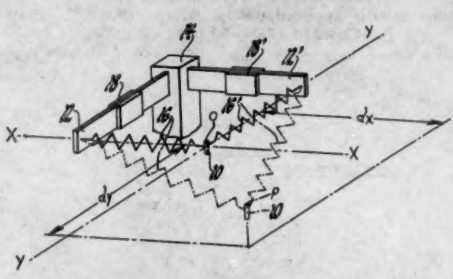
A vegetable peeler wherein the blade shank extends into an enlarged opening in the handle and the shank tip is affixed to the handle by means of a yoke which is cut from the side of and is bent inwardly of the handle to engage the shank.

3,591,924

DISPLACEMENT TRANSDUCER

Alan D. Berg, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 10, 1969, Ser. No. 805,746
Int. Cl. B43l *13/20*
U.S. Cl. 33—1 M **3 Claims**



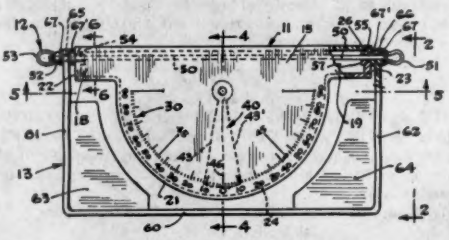
The distance of an object from the intersection of a plurality of mutually perpendicular reference axes is determined by measuring the bending strain on a plurality of cantilever beams each mounted perpendicular to a different one of the reference axes and each connected from its free end to the object by a different one of a plurality of tensioned springs.

3,591,925

LINE ANGLE DEGREE LEVEL INSTRUMENT

Frank Dupin, 3170 Grandview Ave., Waukegan, Ill.

Filed Aug. 5, 1969, Ser. No. 847,594
Int. Cl. G01c *9/00*
U.S. Cl. 33—207 A **10 Claims**



A line angle degree level instrument comprising a protractor body section having a protractor scale with a pendulum-type indicator arm and a rigid support rod extending the length of the body section with eyelet means at each end for attaching a flexible line and a detachable frame member for pivotally supporting the protractor body section adjacent the opposite ends of the supporting rod.

3,591,926

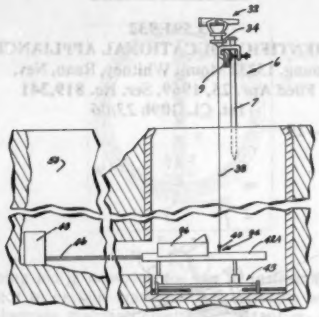
LIGHT BEAM ALIGNING METHOD AND APPARATUS

James R. Trice, Jr., Arlington County, Va., assignor to Contractors Automated Devices, Incorporated, Arlington, Va.

Filed Feb. 8, 1968, Ser. No. 704,024
Int. Cl. G01c *15/00, 1/00*
U.S. Cl. 33—46 **16 Claims**

This disclosure relates to an apparatus and method of aligning articles and obtaining their subgrade such as sewer pipes in a straight line and at a particular grade. The apparatus comprises a sighting means supporting apparatus which is attachable to a support means across a ditch such as a batter board and which positions the sighting means over the central portion of a manhole. The sighting means supporting apparatus has a measuring means and a vertical aligning means to position a light source a predetermined distance directly below the sighting means. The apparatus further comprises a collimated light source, preferably a laser beam, in a housing

which contains a light source alignment means. A supporting structure for the light source is provided, which supporting structure has an adjustable means used in supporting the structure in the inside of a manhole or large pipe whether horizontal or vertical. The supporting structure also contains



a two-point means for roughly and finely adjusting the horizontal and vertical position of the light source. Means are also provided for setting the grade or dip of the light source when the light source is properly aligned in the proper vertical plane at the proper depth.

3,591,927

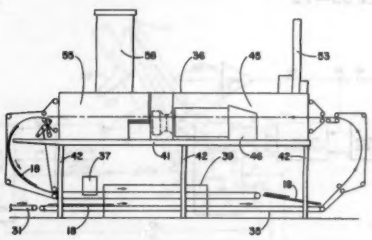
SECONDARY DRYER FOR VENEER AND LIKE MATERIAL

Henry W. Schuette, and Albert H. Barnes, both of Portland, Oreg., assignors to Moore Dry Kiln Company of Oregon, North Portland, Oreg.

Division of Ser. No. 810,996, Mar. 27, 1969, Pat. No. 3,545,094. Filed July 20, 1970, Ser. No. 56,299

Int. Cl. F26b *19/00*

U.S. Cl. 34—66 **4 Claims**



A secondary dryer for wood veneer and similar sheet material having widely varying initial moisture content for completing the drying of that portion of material ("redry") which is underdried after initial passage through a primary dryer. The secondary dryer is arranged in a closed loop configuration, provided by an endless conveyor belt carrying the material in a vertically disposed elliptical path through an overhead drying chamber, so that underdried material is automatically recycled therethrough by the conveyor until the desired degree of final moisture content is achieved.

3,591,928

CONTINUOUS FLUIDIZATION-TYPE POWDER DRYING PLANT AND METHOD OF USE

Jiyuichi Nara, 2-7-8-Higashi-ooi, Shinagawa-ku, Tokyo, Japan

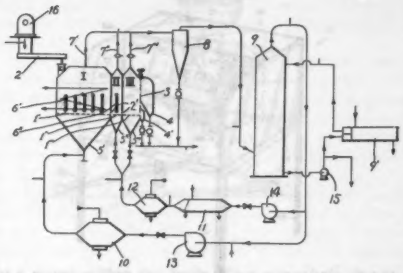
Filed June 18, 1969, Ser. No. 834,325

Claims priority, application Japan, June 27, 1968, 43/44759

Int. Cl. F26b *3/08*

U.S. Cl. 34—10 **3 Claims**

A continuous fluidization-type powder drying plant having a plurality of drying columns transversely parallelly connected thereto, said plant being of the structure in which a plurality of fluidization-type powder drying columns are connected and disposed parallelly at the same height, said columns have porous plates respectively on the same horizontal level, the neighboring columns of said columns communicate with each other only through the gaps between the upper sides of said porous plates and the lower ends of the sidewalls partitioning two drying columns, a first drying



column is provided on one side of the upper portion thereof with a moist powder feeder, a last drying column is provided on the dried powder outlets respectively, any of said drying columns is selectively provided therein with heat exchangers, the heated gas communication chamber of said first column is supplied under pressure with a gas of relatively high humidity, and the other drying columns are provided with a means for feeding a gas of relatively low humidity.

ERRATUM

For Class 33—385 see:
Patent No. 3,592,004

3,591,929

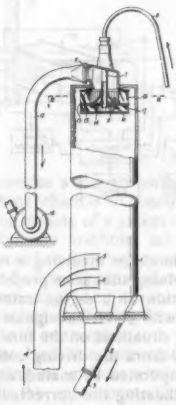
APPARATUS FOR PREHEATING PULVERIZED MATERIAL SUCH AS CEMENT RAW MATERIALS

Zdenek Zacpal, Horni Mostenice, and Petr Nemecek, Prerov, both of, Czechoslovakia, assignors to Prerovske strojirny, narodni podnik, Prerov, Czechoslovakia

Filed July 24, 1969, Ser. No. 844,335

Int. Cl. F26b *17/18;* **F27b** *7/20*

U.S. Cl. 34—57 E **6 Claims**



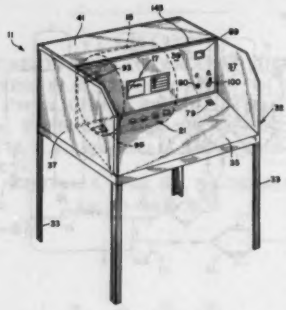
There is provided equipment for preheating pulverized material, such as raw cement materials, to be sintered in a kiln wherein the preheating is performed by dispersing the material by rotary means, while subjecting the same to hot gases recovered from the kiln.

3,591,930

INSTRUCTIONAL APPARATUS

James A. Little, and Henry H. Bruce, 1060 Cerrillos Road, both of Santa Fe, N. Mex.

Filed Nov. 14, 1968, Ser. No. 775,751
Int. Cl. G09b *7/06*
U.S. Cl. 35—9 R **3 Claims**



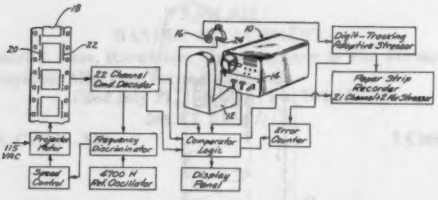
An automatic, electrically controlled teaching machine may be easily programmed by an instructor who may write problems on program cards and secure the latter to a program drum. The teaching machine may be provided with means for operating the same in either a teaching or testing mode. In the teaching mode, the student progresses from one question to the next question only in response to a correct answer choice. In the testing mode, the student progresses from question to question in response to any answer choice, right or wrong, and the test is automatically graded.

3,591,931

ADAPTIVE AUDITORY PATTERN RECOGNITION SYSTEM FOR DRIVER TRAINING AND TESTING EQUIPMENT

Donald H. Schuster, Ames, Iowa, assignor to Iowa State University Research Foundation, Ames, Iowa

Continuation-in-part of application Ser. No. 655,045, July 21, 1967, now Patent No. 3,523,374, dated Aug. 11, 1970. This application Oct. 30, 1969, Ser. No. 872,695
Int. Cl. G09b *9/02*
U.S. Cl. 35—11 **9 Claims**



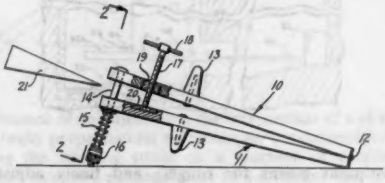
A driver trainer simulator involving a movie film for portraying a series of driving situations projected on a screen in view of a driver station on a driver trainer unit, the movie film being encoded with electrical signals which correspond to successive driving situations on the film and are compared with signals received from the driving controls of the driver trainer upon being operated by a student, an instantaneous display panel for indicating the correctness of the response by the student to each of the successive driving situations and a permanent magnetic-recording means for storing the comparative information. An adaptive stressor unit having an audio unit may be simultaneously used to provide secondary auditory perceptual loading on the student. An auditory pattern recognition device including an audio pickup may be provided to receive the audible responses from the student in response to the sound patterns from the stressor unit. An indicator is provided for indicating correct and incorrect audible responses as compared with the audible responses from the audio unit of the stressor unit. The recognition device indicator may be coupled to the stressor unit to control the rate of loading of the auditory signals on the student.

3,591,932

SCIENTIFIC EDUCATIONAL APPLIANCE

Hiram F. Young, 13232 Mount Whitney, Reno, Nev.

Filed Apr. 25, 1969, Ser. No. 819,341
Int. Cl. G09b *23/06*
U.S. Cl. 35—19 **5 Claims**



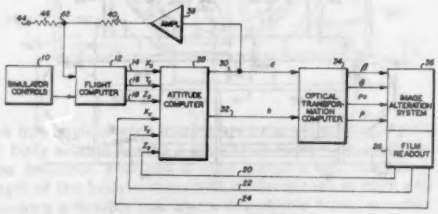
A pair of hingedly connected plate members are equipped with handles so that pupils can attempt to separate the same against the force of springs. The hand screw or other force multiplier is provided with the assembly to emphasize to the pupils the efficiency of such devices in comparison to manual power.

3,591,933

VISUAL SYSTEM COMPUTER

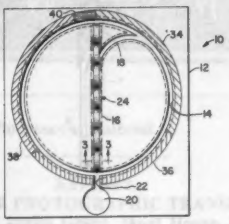
William C. Ebeling, Binghamton, N.Y., assignor to Singer-General Precision, Inc., Binghamton, N.Y.

Filed Dec. 16, 1968, Ser. No. 784,041
Int. Cl. G09b *9/08*; **B64g** *7/00*
U.S. Cl. 35—12 **7 Claims**



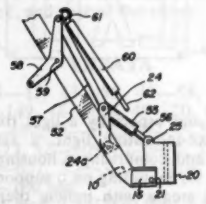
The disclosed embodiment of the present invention is intended to be employed with a flight simulator and the like which utilizes a visual system having a defined envelope, such as a motion picture system with distortion optics to provide translational visual excursions from the imagery of the photographed scenes and an apparent change in prospective of the projected image. The invention is a method of and means for eliminating a cumulative position error derived from the computed position of the flight simulator with respect to the position of the filmed flight path, such that the translational limits of the visual system will not be exceeded. The computed position of the flight simulator is derived from manipulation of the controls by an operator of the simulator. Generally, a quantity proportional to computed lateral position of the simulator from the filmed flight path is employed as an imperceptible "washout" term in the control of the visual system that will tend to neutralize the cumulative position error.

3,591,934
TEACHING AID
Edgar W. Harrington, 130 Ipswich Road, Topsfield, Mass.
Filed Nov. 28, 1969, Ser. No. 880,575
Int. Cl. G09b 23/04
U.S. Cl. 35—34 8 Claims



A teaching aid is provided for use in instructing students with respect to certain mathematical concepts and particularly to illustrate the mathematical constant π. A board is provided with a circular track and a diametrical track connected therewith. A flexible or articulated slide having a length corresponding to that of the diametrical track is mounted to be moved selectively from the circular track to the diametrical track. The board is provided with color-coded arcuate bands demonstrating the relationship between the diameter and circumference, the slide being used to determine how many times the length of the slide may be contained without overlapping in traversing the circular track.

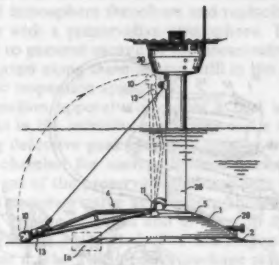
3,591,935
EARTH MOVING EQUIPMENT
Mark H. Bremmer, 145 Garland St., and Albert R. Hiler, 145 Holland St., both of Denver, Colo.
Filed July 22, 1968, Ser. No. 746,594
Int. Cl. E02f 3/85
U.S. Cl. 37—117.5 3 Claims



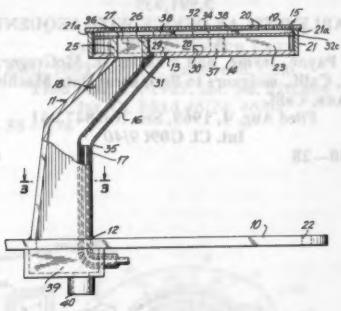
A lever gudgeon and connector block between earth-contacting mechanism and the lifting arms of a prime mover permits the earth-contacting mechanism to be pivoted at different angles both horizontally and vertically to such lifting arms for performing various operations without moving the prime mover, which block extends between the lifting arms providing a lever with extensive mechanical advantage and, also, permits horizontal, diagonal, and vertical pivoting of the earth-contacting equipment as attachments to the lifting arms without binding or impingement thereof.

3,591,936
SUBMARINE CUTTER DREDGER
Wouter Van Guens, Menton, France, assignor to Koninklijke Maatschappij tot het uitvoeren van openbare werken "Adriaan Volker" N. V., Rotterdam, Netherlands
Filed Jan. 15, 1969, Ser. No. 791,261
Int. Cl. E02f 3/88, 9/04
U.S. Cl. 37—56 4 Claims

A submersible dredge including a dome-shaped body to rest on the bottom of a waterway and having a vertical air shaft to atmosphere. The dome is formed in part by a rotatable annular mounting to which one end of a ladder is pivotally mounted, and on the other end of the ladder is a soil digging tool forward of one end of a suction tube. A driving motor for the tool is mounted on the ladder at the tool, above the inlet end of the suction tube, the latter being connected to a pump within the body. Two oppositely disposed sets of legs are provided to propel the dredge on the bottom of a waterway, the sets being operated alternately and each comprising three legs including one pair which are vertically movable and horizontally shiftable together, the other leg being in effect a prop.

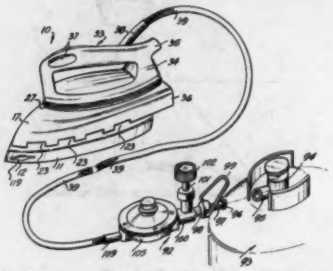


3,591,937
BUCK FOR PRESSING MACHINES
Sam Goldstein, New York, N.Y., assignor to Sam Goldstein, Inc.
Filed July 9, 1969, Ser. No. 840,391
Int. Cl. D06f 71/00, 71/34
U.S. Cl. 38—17 4 Claims



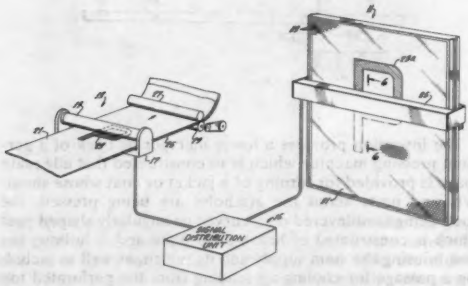
The invention provides a lower member or buck of a garment pressing machine which is so constructed that adequate space is provided for turning of a jacket or coat whose shoulders and parts about the armholes are being pressed, the buck being cantilevered on a curved or angularly shaped post which is constructed of heavy steel plate and is hollow, the post housing the stem supply and its return, as well as including a passage for cooling air leading from the perforated top plate of the buck to a connection to a vacuum pump. The upper member of the buck is constructed to provide a space for the entry of heating steam from within the post and also a connection between the space immediately below the perforated top plate and the air passage in the post, re-enforcements being provided to enable the top member to withstand the shock and pressure of the usual head of the pressing machine. In the preferred construction, the post is of approximately triangular cross section and tapered upwardly, a tubular steam and condensate return forming a vertex of the triangle.

3,591,938
GAS-HEATED FLATIRON
Gustavo Rivas Arbulo, Montevideo, Uruguay, assignor to Tem Sociedad Anonima, Montevideo, Uruguay
Filed Nov. 4, 1969, Ser. No. 873,918
Claims priority, application Brazil, Oct. 4, 1968, 204 546
Int. Cl. D06f 75/02, 75/08
U.S. Cl. 38—82 14 Claims



A gas-heated flatiron having a soleplate on which a cover shell is mounted which is separated into a main chamber and a rear chamber spaced apart by a heat-insulating cross partition, the main chamber supporting a housing for a heat-radiating infrared ray emitting flame plate connected to the rear chamber through a gaseous combustion mixture feeding pipe facing a nozzle housed in said rear chamber. The nozzle being connectable to a gas supply source and the rear chamber being open to atmosphere so that injection of gas and entrained air is injectable into said gaseous combustion mixture feeding pipe. Said nozzle is accessible from outside and thereby interchangeable without having to disassemble the flatiron.

3,591,939
BISTABLE DISPLAY DEVICE WITH SEQUENTIAL ACTUATOR
Errol G. Payne, Irvine, and Charles D. McGregor, Tustin, both of, Calif., assignors to Peripheral Data Machines, Inc., Santa Ana, Calif.
Filed Aug. 4, 1969, Ser. No. 847,341
Int. Cl. G09f 9/40
U.S. Cl. 40—28 4 Claims

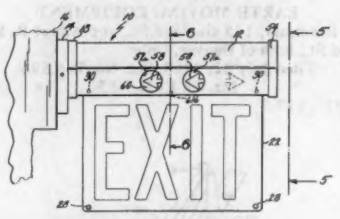


A display board comprising a mosaic of bistable magnetic elements is swept by a linear array of electromagnets pulsed selectively to form an image. Each magnetic element is a sealed humped duct containing magnetic powder pulled to the rear of the duct by a common magnetic erasing bar. Means are also disclosed for optically converting an image into electric pulses which are used to drive the electromagnets to reproduce that image upon the display board.

3,591,940
SUPPORTING FRAME
John W. Slemmons, 19142 Glen Albyn, Orange, Calif.
Filed Mar. 19, 1969, Ser. No. 808,591
Int. Cl. G09f 7/18
U.S. Cl. 40—125 G 3 Claims

Two opposite edges of a collapsible sheet such as a poster are releasably clamped to previously sized frame members. A spring member also previously sized is wedged between the frame members to force the members apart. As a result, the poster is suspended under tension between the frame members. In other embodiments, the poster may be suspended with only one clamped edge and without the spring member.

3,591,941
LIGHT FIXTURE
Joseph L. Jaffe, Jr., Shaker Heights, Ohio, assignor to Perfeclite, Inc., Cleveland, Ohio
Filed Jan. 26, 1968, Ser. No. 700,799
Int. Cl. G09f 13/18
U.S. Cl. 40—130 K 10 Claims



A light fixture and especially a light fixture of the type comprising an exit-indicating light, a restroom-indicating light or the like, and comprising a housing having an open end, and adapted for mounting on a supporting surface. The fixture has panel means with indicia thereon such as the words "Exit" or "Restroom" or the like, with the housing having a removable powerpack, either a fluorescent powerpack or incandescent powerpack, slidably supported on rails in the housing, for illuminating the housing and panel means. The powerpack has an end cover secured thereto which closes the open end of the housing when the powerpack is disposed in operative position in the housing. When the powerpack is in operative position in the housing, an electric plug on the powerpack coacts with an electric socket mounted in the housing, for connecting the powerpack to a source of current. Replacement of the powerpack or components thereof can be readily made by merely grasping the end cover on the powerpack and sliding the powerpack from the housing.

3,591,942
REPRODUCTION OF PICTURES
Earl C. Van Swearingen, 5714 Swiftwood Parkway, Cape Coral, Fla.
Filed Aug. 3, 1967, Ser. No. 662,560
Int. Cl. G09f 7/00
U.S. Cl. 40—135 15 Claims

A pictorial illustration is printed in several colors one of which is a daylight activated fluorescent material backed by a

reflective layer so as to enhance the brilliance of the daylight

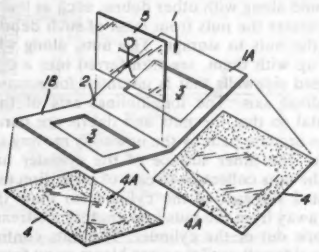
activated daylight fluorescent material.

3,591,943

MOUNTINGS FOR PHOTOGRAPHIC TRANSPARENCIES

Bertram Edward Charles Green, Moat House, Badwell Ash, Bury St. Edmunds, Suffolk, England

Filed May 26, 1969, Ser. No. 827,611
Claims priority, application Great Britain, May 28, 1968, 25,545/68
Int. Cl. G09f *1/10*
U.S. Cl. 40—158 **6 Claims**



The described invention relates to means for protectively mounting photographic transparencies and similar specimens for viewing or projection and resides basically in providing for two protective transparent sheets, on each side of the transparency itself, and spaced therefrom.

ERRATA

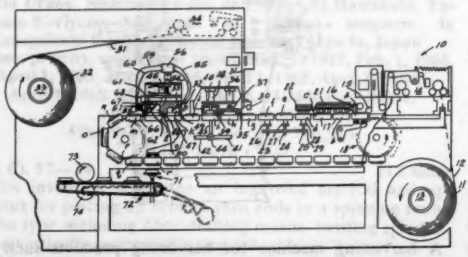
For Classes 43—15, 43—56, 43—58, 46—25, 46—33, 46—87, 46—149, 46—175, 49—70, 49—91, 49—139, 49—227, 49—410, 49—504, 51—55, 51—105, 51—268, 52—67, 52—73, 52—309, 52—475, 52—648, 52—693, 52—716, 52—657, 53—3, 53—214, 53—26, 53—55, 53—159, 53—186 see:
Patent Nos. 3,591,970 thru 3,592,003

3,591,944

METHOD AND APPARATUS FOR DETECTION OF LEAKS IN SEALS OF PACKAGES

Burdsal G. Wilcox, Oakland, Calif., assignor to Safeway Stores, Incorporated, Oakland, Calif.

Filed Mar. 3, 1969, Ser. No. 803,798
Int. Cl. B65b *31/02, 57/00;* G01m *3/34*
U.S. Cl. 53—22 **35 Claims**



A machine for forming and testing sealed packages from heat-sealable packaging materials employs an apparatus for forming individual packaging trays for receiving the product to be packaged from a first continuously fed web of heat-sealable flexible packaging material. A second continuously fed web of heat-sealable packaging material is directed along a path parallel to the path of the first web and is partially heat sealable thereto to package the product. After partial sealing, each of the serially connected train of packages is connected in fluid communication with means for evacuating the ambient atmosphere therefrom and replacing the ambient atmosphere with a preservative atmosphere. The package is then sealed to prevent escape of the preservative atmosphere and transported along the machine, still in the package train, to automatic inspection apparatus.

The inspection apparatus provides a first section for detecting leaks in the individual packages and a second section for marking defective packages. The sensing section includes a pressure chamber for each individual package and means for sensing gas of the preservative atmosphere or a tracer gas portion of the preservative atmosphere should the inspected package be leaking such gas and to develop a control signal when gas leakage is detected. The marking section includes apparatus for marking a defective package received from the sensing section. An electrical control circuit extends between the sensing and the marking section to provide operative control of the marking apparatus at a delayed time which permits the travel of a package from the sensing section of the packaging machine to the marking section of the machine.

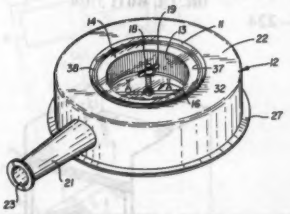
After inspection, the packages are separated and the unmarked packages are then prepared for shipment while the marked packages are diverted so that their products may be repackaged. Inasmuch as the packages may be scuffed or in other ways have the integrity of their seals weakened or broken, for example the package material may be burned by labelling techniques, the packages are placed in an overwrap carton and the carton is subjected to another pressure test prior to sealing whereupon detection of the preservative atmosphere will signal that the carton contains a leaky package or packages. Cartons containing only sealed packages may then be further packaged for shipment and cartons containing leaky packages may be diverted for testing of the individual packages.

3,591,945

ENGINE AIR FILTER UNIT

Charles Eisel, 1009 Carr St., Lakewood, Colo.

Filed Mar. 27, 1969, Ser. No. 818,464
Int. Cl. B01d *46/24, 46/04*
U.S. Cl. 55—274 **4 Claims**



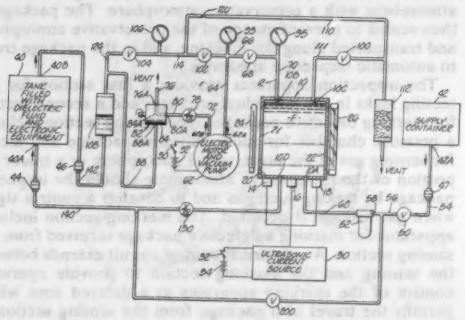
A transparent component or cover for the air intake filters of internal combustion engines positioned to reveal working parts and operation of carburetors, etc. Inspection and servicing or replacement of the filter element and/or carburetor components is facilitated by configurations in which the transparent component is removable from the filter unit body. Seals are provided between the transparent component, the filter element and filter unit body for efficient useage.

3,591,946

FLUID-DEGASSING SYSTEM

Wallace Dawson Loe, Lakeside, Calif., assignor to Loe Industries

Filed Nov. 26, 1968, Ser. No. 779,074
Int. Cl. B01d 19/00
U.S. Cl. 55—189 6 Claims



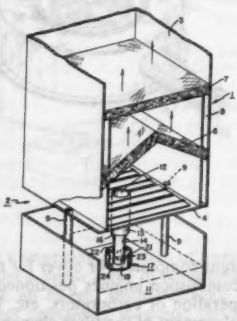
The system removes gases and moisture from dielectric fluids such as, for example, insulating oils normally used to provide electrical insulation between electrical components in a tank filled with such dielectric fluid. Degassing occurs in a treatment reservoir into which the fluid is initially introduced and such degassing is accomplished using a combination of vacuum and ultrasonic vibration and also, in some instances, the fluid may be heated in the reservoir to a sufficiently high temperature to assure efficient liberation of moisture from the fluids. Special valving and connections between the treatment reservoir, the aforementioned tank and a supply container provides versatility and transfer of fluids under optimum conditions. For example, the fluid may be first introduced into the treatment reservoir from a supply container and then after treatment in the reservoir be transferred to the tank wherein the same serves as an insulating medium for electronic equipment; alternatively the fluid already in the tank may be treated by causing the same to enter the treatment reservoir for treatment after which the fluid is returned to such tank.

3,591,947

LIQUID BATH GAS-CLEANING APPARATUS

Robert W. Sexton, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Apr. 19, 1968, Ser. No. 722,695
Int. Cl. B01f 3/04
U.S. Cl. 55—224 4 Claims



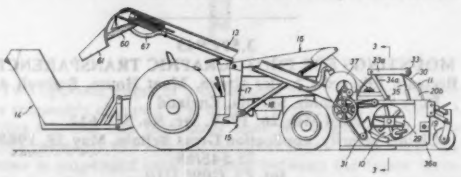
An improved liquid bath gas-cleaning apparatus including a gas-liquid contact tray having pivotally mounted slats arranged to pivot from a horizontal position transverse the gas flow path during low-volume gas flow operations to a vertical parallel position relative the gas flow path during high-volume gas flow operations.

3,591,948

HARVESTER FOR NUTS AND THE LIKE

Berstrand L. Brumbaugh, Perry; Eugene P. Brumbaugh, Fort Valley, Ga., and Claude A. Riche, Thibodaux, La., assignors to Thomson Machinery Co., Thibodaux, La., by said Riche, a part interest

Filed July 10, 1968, Ser. No. 756,697
Int. Cl. A01d 51/00
U.S. Cl. 56—328 R 10 Claims



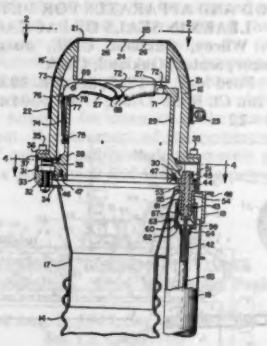
A harvester is disclosed that sweeps nuts and the like from the ground along with other debris, such as leaves and sticks, and separates the nuts from most of such debris before conveying the nuts to storage. The nuts, along with the debris picked up with them, are transferred into a cylinder having perforated sidewalls that is mounted for rotation around its longitudinal axis. The longitudinal axis of the cylinder is horizontal so that the nuts and debris are carried upwardly along an arcuate path by the upwardly moving sidewall of the cylinder. The inner surface of the cylinder has pockets in which the nuts collect. A stream of air is directed through the perforated sidewall of the cylinder to blow the debris upwardly away from the nuts into another airstream that carries the debris out of the cylinder. The nuts continue upwardly with the sidewall until they are blown away from the sidewall into a hopper positioned inside the cylinder. From the hopper, the nuts are transferred to a storage bin by a belt conveyor and a pivotally mounted chute having a perforated bottom. The chute is arranged so that transverse flights on the belt, which move the nuts with the belt, cause the chute to oscillate and bounce the nuts as they pass through the chute. This further cleans the nuts prior to their reaching the storage bin.

3,591,949

FRUIT-HARVESTING MACHINE

William E. Connery, Perdido Key, Fla., assignor to Chisholm-Ryder Company, Inc., Niagara Falls, N.Y.

Filed Apr. 17, 1969, Ser. No. 817,016
Int. Cl. A01g 19/08
U.S. Cl. 56—332 17 Claims



A harvesting machine for harvesting products such as oranges, or the like, including a picker head connected by

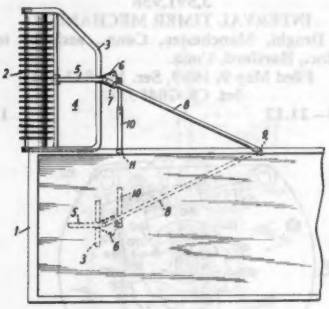
means of an elongated conduit to a collector box, a fan in communication with the collector box for evacuating the box and thus producing a suction in the conduit, an apertured flexible diaphragm on the picker head for providing sealing engagement with the product so as to permit the suction to exert a pulling force on the product, and a twister head including a plurality of resilient fingers mounted thereon, said twister head being mounted on said picker head and being rotated by a motor to cause said fingers to engage the product with a twisting force to thereby provide a combined pulling and twisting force on the product to sever it from the tree.

3,591,950

LOADING CAR WITH TAKEUP MEMBER OPERATING OUTSIDE THE VEHICLE TRACK

Ernst Weichel, Bahnhofstr. 1, 7326, Heiningen Kreis, Goppingen, Germany

Filed Oct. 3, 1967, Ser. No. 672,487
Claims priority, application Germany, Oct. 4, 1966, W42,517
Int. Cl. A01d *89/00*
U.S. Cl. 56—364 **18 Claims**



A tractor-drawn crop carrying vehicle has a load receiving surface, a conveyor duct discharging upwardly onto the receiving surface and having a width coextensive with that of the receiving surface, conveying means operable in a conveyor duct to move harvested material along the duct to the receiving surface, a crop receiving drum, a frame mounting the drum and a transverse conveyor device conveying material from the receiving drum to the conveyor duct. The frame is mounted on the vehicle for movement between a first position, in which the drum extends perpendicularly to the path of vehicle movement and completely to one side of the vehicle, and a second position, in which the drum also extends perpendicularly to the direction of vehicle movement but is retracted beneath the vehicle. Releasable bracing and locking means are provided for maintaining the frame and the drum in each of the two positions. Various auxiliary elements cooperate with the drum, the transverse conveyor device and the conveyor duct, and may include, for example, cutting means operable to sever the harvested material as it is moved laterally into the conveyor duct.

3,591,951

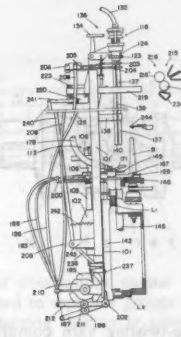
YARN PIECING APPARATUS FOR SPINNING FRAME

Yukio Urano, Nishinomiya-shi, and Shin-ichi Hamabata, Yamato-Koriyama-shi, both of, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo-to, Japan

Claims priority, application Japan, Sept. 1, 1967, Feb. 1, 1968, April 1, 1968, April 1, 1968, April 1, 1968, April 1, 1968, April 1, 1968, 42/56261, 43/6976, 43/26303, 43/26304, 43/21706, 43/21705, 43/21664
Filed Sept. 3, 1968, Ser. No. 756,961
Int. Cl. D01h *15/00*
U.S. Cl. 57—34 **11 Claims**

This invention relates to an improved method and apparatus for piecing-up broken yarn ends in a spinning frame of the type including fiber drafting means, twisting spindles, and a vertically reciprocable ring rail.

The apparatus comprises a carriage mounted on the spinning frame for movement therealong and carrying a supply of auxiliary yarn. The carriage has a portion movable up and down with the ring rail and carrying means for operatively engaging the free end of the auxiliary yarn with a ring traveller and also with a bobbin on the spindle for winding and twisting the yarn. The carriage also carries means for moving an intermediate portion of said yarn into engagement



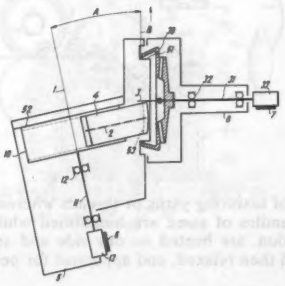
with a broken yarn end or roving extending from the front drafting rolls into a flute, so that when the auxiliary yarn is severed adjacent the roving it will untwist and attach itself thereto to effect the piecing-up operation. In the preferred embodiment the carriage has means for automatically withdrawing a predetermined length of auxiliary yarn and storing it for subsequent release into a narrow passage where it is held under tension just prior to a piecing-up operation.

3,591,952

OPEN END SPINNING APPARATUS

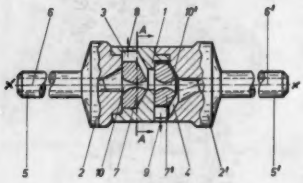
Josef Ripka; Frantisek Hortlik; Jan Junek; Milan Marsalek, and Stanislav Kabele, all of Usti Nad Orlici, Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti Nad Orlici, Czechoslovakia

Filed Aug. 8, 1969, Ser. No. 849,301
Claims priority, application Czechoslovakia, Aug. 10, 1968, 5820-68
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.95 **10 Claims**



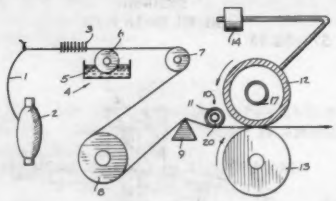
A spinning apparatus comprises a rotary spinning chamber mounted for rotation about a first axis and having in its interior an internal circumferential slip surface concentric with this first axis and onto which fibers to be spun are to be deposited. A carding roller is mounted for rotation about a second axis, and a fiber supply channel connects the carding roller with the interior of the spinning chamber to transmit fibers from the carding roller to the spinning chamber. The outlet opening of the supply channel is located in a plane paralleling the first axis of rotation of the spinning chamber and is so configurated as to discharge fibers at right angles to this first axis onto an area of the slip surface which corresponds in outline at least substantially to the configuration of the outlet opening.

3,591,953
SPINDLE FOR FALSE TWISTING YARN
Ernst August Weinz, Idar-Oberstein, Germany, assignor to Ernst Fr. Weinz, Idar-Oberstein, Germany
Filed Oct. 29, 1969, Ser. No. 872,049
Claims priority, application Germany, Oct. 31, 1968, P 18 06 218.5
Int. Cl. D02g 1/06; D01h 7/92
U.S. Cl. 57—77.3 **5 Claims**



A spindle for false-twisting yarn comprising a rotatable body and yarn guides mounted in the body engaging said yarns. The guides are deflected under centrifugal action during rotation of the spindle to twist to yarn.

3,591,954
APPARATUS AND METHOD FOR PRODUCING A TEXTURED THREAD
Lajos Horvath, Kirchenweg 3, Wallisellen, and Hans Heinz Schafer, Schwerzenbacherstrasse 30, Fallanden, both of Canton of Zurich, Switzerland
Filed June 16, 1969, Ser. No. 833,484
Claims priority, application Switzerland, June 17, 1968, 8954/68
Int. Cl. D02g 1/00
U.S. Cl. 57—140 R **10 Claims**



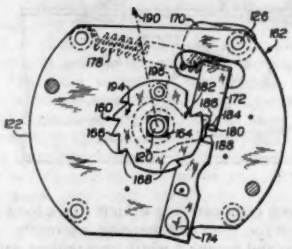
Method of texturing yarns or threads wherein filaments or filament bundles of same are humidified while under controlled tension, are heated on one side and are cooled and pressed and then relaxed, and apparatus for performing such method.

3,591,955
PROCESS FOR PRODUCING A SLUB YARN
Shiro Fujita, Tokyo; Jusuke Ushiki, Isezaki-shi; Nagao Nishizawa, Matsudo-shi; Seiji Okawa, Warabi-shi; Kunio Sekiya, Matsudo-shi, and Hiroshi Kadowaki, Matsudo-shi, all of, Japan, assignors to Nippon Rayon Co. Ltd., Tonouchi Uji-Uji-shi, Japan
Filed June 23, 1969, Ser. No. 835,553
Claims priority, application Japan, June 27, 1968, June 27, 1968, 43/44691; 43/44692
Int. Cl. D02g 1/16, 3/34
U.S. Cl. 57—157 **7 Claims**

A process for producing slubs onto a multifilament yarn which comprises feeding the yarn into a hood receiving a jet of compressed gas and withdrawing the yarn through a hole

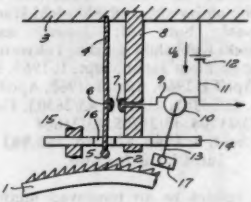
of the hood from the deflected stream of the gas at lower rate than the feed rate.

3,591,956
INTERVAL TIMER MECHANISM
James A. Draghi, Manchester, Conn., assignor to M. H. Rhodes Inc., Hartford, Conn.
Filed May 9, 1969, Ser. No. 823,291
Int. Cl. G04f 3/02
U.S. Cl. 58—21.13 **12 Claims**



An interval timer with an audible or electrical output has a springwound motor driving a control cam which governs the output mechanism, whereby to enable operation upon the completion of time intervals of irregular duration. A blocking member obstructs movement of the control cam follower to prevent any output if the mainspring is not fully wound.

3,591,957
VOLTAGE MEASURING AND INDICATING ARRANGEMENT
Claus Christian Cobarg, Steinbach/Taunus, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Dec. 6, 1968, Ser. No. 781,935
Claims priority, application Germany, Dec. 8, 1967, P 15 91 859.9
Int. Cl. G04b 47/06
U.S. Cl. 58—152 **6 Claims**



An arrangement for measuring the voltage of a battery to determine the state of charge of the battery when used to

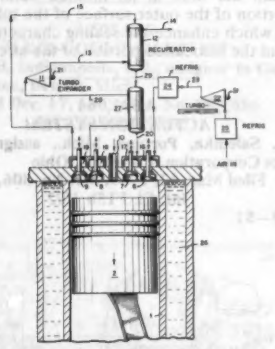
operate electrical clocks. A momentary contact switch actuated by the clock mechanism at regular time intervals, connects the battery to a voltage-measuring instrument. An indicating device associated with the instrument is held in place by a holding device, after the measurement has been taken. The indicating device becomes released and permitted to return to its initial position prior to the instant when a subsequent measurement is to be taken. The clock mechanism in the form of the hour wheel actuates the momentary constant switch.

3,591,958

INTERNAL COMBUSTION ENGINE CYCLE

William H. Nebgen, Woodside, N.Y., assignor to Treadwell Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 844,776, July 25, 1969, now abandoned. This application June 24, 1970, Ser. No. 49,340
Int. Cl. F02b 37/00
U.S. Cl. 60—13 14 Claims



An internal combustion engine cycle is described which comprises: a compression step conducted in an external booster compressor, preferably with cooled suction, such as a supercharger; a final compression step conducted within the cylinder; an external isobaric recuperative heat addition step in which the fully compressed air is heated, preferably to the temperature needed for autoignition of fuel; an isobaric or isochoric fuel injection heat addition step; an isentropic expansion step conducted within the cylinder; a further isentropic expansion step conducted in an external expander, such as the turbine of a supercharger; and finally an external isobaric recuperative heat rejection step.

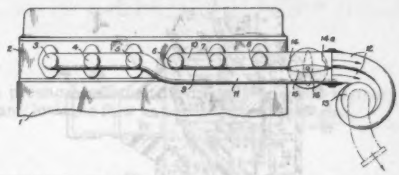
Each cylinder of the internal combustion engine is provided with four valves, consisting of one set of hot and cold intake valves and one set of hot and cold exhaust valves. Externally compressed air is cooled and introduced into the cylinder through the cold intake valve, thus driving the piston down, and simultaneously cooling the engine elements. On the return stroke of the piston the air is further compressed to the high pressure desired for the succeeding working stroke, is discharged from the cylinder through the cold exhaust valve, is heated by exhaust heat recuperation, for example to autoignition temperature, and is reintroduced into the cylinder through the hot intake valve. Fuel is injected into the cylinder and burned, and gases expand in and are discharged from the cylinder through the hot exhaust valve at above ambient temperature and pressure, and are then cooled by doing external work, which constitutes at least a part of the power required for the compression of the cold air. The work of compression may be reduced by refrigerating the air at the suction of each compressor stage.

3,591,959

ENGINE EXHAUST GAS BRAKING

Heribert Kubis, Nurnberg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nurnberg, Germany

Filed July 29, 1969, Ser. No. 845,774
Claims priority, application Austria, Aug. 7, 1968, A 7734/68
Int. Cl. F02b 37/00; F02d 9/00
U.S. Cl. 60—13 4 Claims



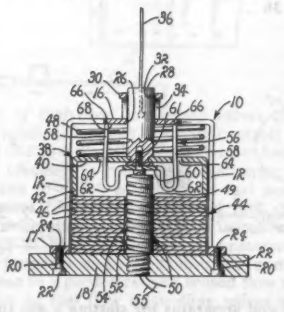
For an internal combustion engine brake, two exhaust pipes are connected to separate groups of cylinders, and an intake-air-supercharging turbine is joined to said pipes for being driven by the exhaust gases, a throttle valve is positioned between the cylinders and the turbine which is common to the pipes for bringing the pipes into gas-equalizing communication when the throttle valve closes off the turbine to brake the engine.

3,591,960

THERMOSTATIC ACTUATOR

T. O. Paine, Administrator of the National Aeronautics and Space Administration in respect to an invention; Lloyd J. Derr, 4624 Willa Lee Ave., LaCrescenta, Calif., and Robert A. Tobias, 1523 Harding Ave., Pasadena, Calif.

Filed Aug. 19, 1969, Ser. No. 851,298
Int. Cl. G05d 1/00
U.S. Cl. 60—23 8 Claims

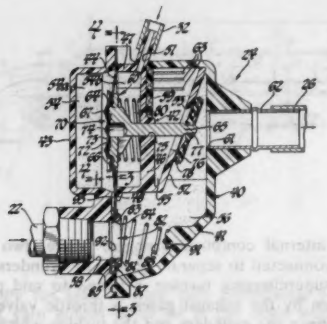


A thermostatic actuator for imparting displacement to mechanical linkages and the like, having particular utility aboard spacecraft and characterized by the utilization of a rectilinearly reciprocating, spring-biased output shaft operatively coupled with a stack of superimposed individual bimetal disc members and a selectively operable electric heater including a resistance coil associated therewith adapted to heat the stack for achieving distortion of the individual disc members and an elongation of the stack to cause the output shaft to be axially extended against the bias of the spring and a bimetal latch coupled with the shaft adapted to latch the shaft against axial extension, at a first temperature, and to release the shaft for an extending displacement at elevated temperatures, whereby the actuator is selectively driven by energizing the heater.

3,591,961
AIR PUMP FLOW CONTROL VALVE FOR ENGINE EXHAUST EMISSION CONTROL SYSTEM

Charles D. Woodward, and Arthur P. S. Hyde, both of Saginaw, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 18, 1969, Ser. No. 886,254
Int. Cl. F01n *3/10*
U.S. Cl. 60—30 **7 Claims**

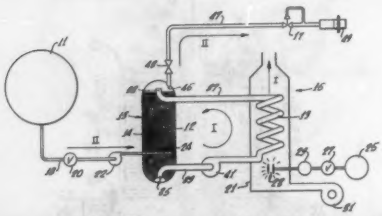


An engine having an exhaust air injection system in which an engine-driven pump delivers air to the stream of exhaust gases as they are emitted from the combustion chamber and is equipped with a flow control valve which opens at high engine speeds to divert air from the exhaust air injection system prevent excessive exhaust system back pressure and resulting power loss.

3,591,962
CRYOGENIC POWER SOURCE FOR STARTING JET ENGINES

Joseph A. Connell, Harbor City, Calif., assignor to Systems Capital Corporation

Filed May 26, 1969, Ser. No. 810,744
Int. Cl. F01k *25/00*; F17c *9/02*; F02n *17/00*
U.S. Cl. 60—36 **16 Claims**



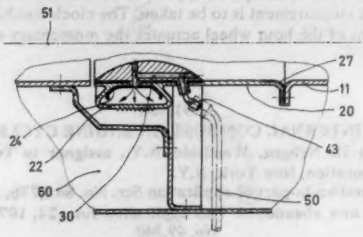
A method and apparatus for starting a gas turbine engine by vaporizing a cryogenic liquid such as liquid nitrogen, raising the resulting gas to a high temperature and pressure and applying the hot pressurized gas to the air-driven turbine starter of the gas turbine engine.

3,591,963
INFLATABLE SEAL FOR AIRCRAFT JET ENGINES

Gerhard Kopp, Munich, Germany, assignor to Entwicklungsring Sud GmbH, Munich, Germany

Filed June 13, 1969, Ser. No. 833,017
Claims priority, application Germany, June 18, 1968, P 17 51 550.3
Int. Cl. F02c *7/20*; F16j *15/46*
U.S. Cl. 60—39.31 **11 Claims**

A sealing means for providing a seal between the intake of a jet engine and the receiving ring of an air intake duct mounted upon the airframe. The sealing means includes a cylinder of flexible material, one end of which is secured to the intake duct. Formed integrally with the cylinder and located adjacent the end of the cylinder farthest from the engine is an inflatable annular tube. Located within the tube is a resilient flattening member which, upon deflation of the tube, expands to flatten the tube so as to facilitate installation

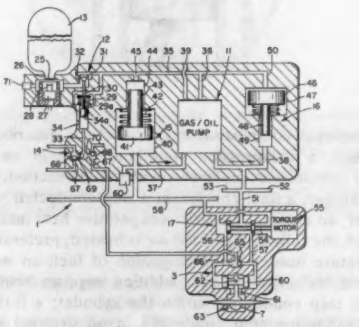


or removal of the engine. The interior of the tube is, through a directional flow control valve, in communication with the exhaust air chamber of the engine so that the exhaust gases will maintain the tube in an inflated condition. Disposed about a portion of the outer surface of the tube are a plurality of lands which enhance the sealing characteristics between the tube and the associated portion of the aircraft structure.

3,591,964
ACTUATION SYSTEM

Robert M. Salemka, Portage, Mich., assignor to Pneumo Dynamics Corporation, Cleveland, Ohio

Filed Mar. 12, 1969, Ser. No. 806,612
Int. Cl. F15b *1/02*
U.S. Cl. 60—51 **17 Claims**



An actuation system which is operated by compressed fluid at a pressure determined by a pressure regulator responsive to the highest load signal acting on the system to vary the pressure in accordance with the actual output demands.

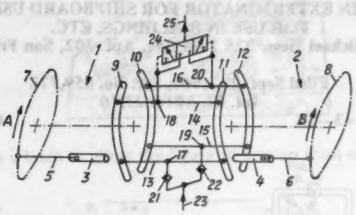
3,591,965
HYDRODRIVE

Gerhard Bobst, Oensingen; Kurt Christiansen, Oberbuchsiten, Switzerland; Ludwig Wagenseil, Vohringen, and Joachim Frank, Ulm-wiblingen, Germany, assignors to A. G. VonRoll, Gerlafingen, Switzerland and Constantin Rauch, KG, Ulm (Danube), Germany, part interest to each

Filed Nov. 14, 1969, Ser. No. 876,907
Claims priority, application Switzerland, Nov. 29, 1968, 17851/68
Int. Cl. F16d *31/02*; F15b *15/18*
U.S. Cl. 60—53 A **14 Claims**

There is disclosed a hydrodrive including a fluid-circulating drive system comprising at least two hydrounits connected by connecting conduit means with one unit being operable as a hydropump and the other unit being operable

as a hydromotor. A feeding and flushing means is provided for feeding fluid media into and removing fluid media from said fluid-circulating drive system. At least one of the connecting conduit means between said hydrounits includes at



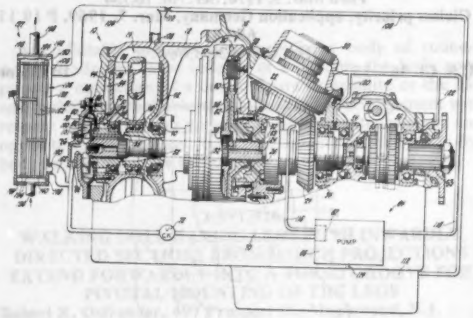
least two lines and said feeding and flushing means including a feeding connection communicating with one of said lines and a flushing connection communicating with the other of said lines.

3,591,966

FLUID-COOLING SYSTEM

Nathaniel B. Kell, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1969, Ser. No. 885,886
Int. Cl. F16d *33/00*
U.S. Cl. 60—54 **6 Claims**



A transmission having a torque converter drive and an alternate mechanical drive between the transmission input and output members where the torque converter, during converter drive operation, provides a centrifugal pressure head between the fluid inlet to the operating chamber and the fluid outlet from the operating chamber for the circulation of the torque converter operating fluid and lubricating fluid through the labyrinth path of a heat exchanger. An impeller mechanism, secured to the continuously rotating inner race of a one-way clutch, provides the means for forcing said fluid through the torque converter passages, and thence through the heat exchanger during direct or "lockup" drive when the torque converter is inoperative.

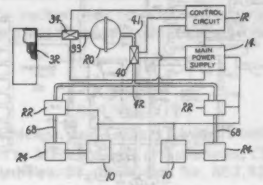
3,591,967

FEED SYSTEM FOR AN ION THRUSTER

Paine, T. O., Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Tommy D. Masek, 3788 Cloud Ave., La Crescenta, Calif.

Filed Sept. 5, 1968, Ser. No. 760,114
Int. Cl. F03h ; H05h *1/00*
U.S. Cl. 60—202 **1 Claim**

A system for delivering vaporized mercury to an electron bombardment ion engine characterized by a source of liquid mercury, pressurized by Freon vapor for force-feeding liquid mercury to a mercury vaporizer operated at a temperature



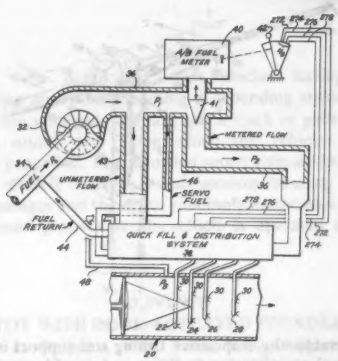
and a pressure sufficient to deliver vaporized mercury at a constant, low-rate flow to an associated ion engine.

3,591,968

AFTERBURNER FUEL MANIFOLD QUICK FILL AND FLOW DISTRIBUTION APPARATUS

Samuel E. Arnett, South Bend, Ind., assignor to The Bendix Corporation

Filed Dec. 15, 1969, Ser. No. 884,860
Int. Cl. F02k *3/10*
U.S. Cl. 60—243 **10 Claims**



A plurality of fuel flow controlling valves connected in parallel flow relationship each of which controls fuel flow to an associated one of a plurality of afterburner fuel manifolds. The plurality of valves is connected to separate pressurized fuel sources one of which is unmetered fuel and other metered afterburner fuel. Normally closed fuel shutoff valve means and flow sensing means upstream from the plurality of valves operate to establish a flow of unmetered fuel for manifold fill purposes and disestablish the unmetered fuel flow in response to a predetermined sensed flow signal. Each of the plurality of fuel flow controlling valves is dual flow controlling in that it occupies a first open position permitting fill fuel flow and blocking metered fuel flow and a subsequent second open position where such flow relationship is reversed. Afterburner control apparatus is connected to the plurality of valves to energize the same in a predetermined sequence.

3,591,969

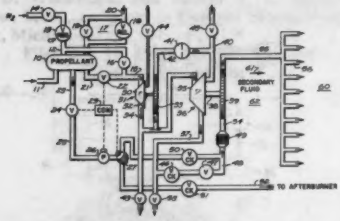
EJECTOR PUMPING SYSTEMS

George V. Brereton, Sacramento; Robert J. Kuntz, Rancho Cordova; Charles J. O'Brien, Citrus Heights, and Roy G. Sjogren, Carmichael, all of, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Aug. 18, 1969, Ser. No. 842,912
Int. Cl. F02k *9/02;* **F04d** *25/02*
U.S. Cl. 60—259 **10 Claims**

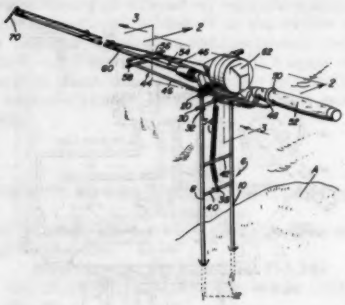
An ejector pumping system according to this disclosure includes an impeller pump driven by a turbine for pumping

monopropellant to a catalyst pack where the monopropellant



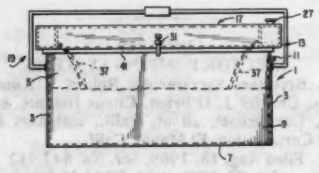
is decomposed to form exhaust gas. The turbine is driven by exhaust gas from the catalyst pack.

3,591,970
FISHING ROD HOLDER AND CATCHER
Donald W. Davenport, 109 Oakhill Place, North Little Rock, Ark.
Filed Aug. 18, 1969, Ser. No. 851,006
Int. Cl. A01k *97/00*
U.S. Cl. 43—15 **8 Claims**



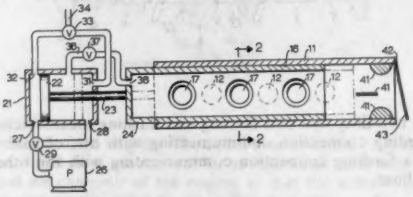
A portable bite-responsive fishing rod support is equipped with novel coordinating facilities and provides a structurally practical automatic fish catcher. A vertical frame provides a desirable ground-supported stand. A second complemental frame provides a fishing rod holder and is responsively cradled atop the stand. A spring-loaded trigger latch is released by a trip chain actuated by the tiltable rearward part of the rod holder. When the front end of the properly cocked holder is sprung the line is forcibly yanked and the fishhook is set in the mouth of the fish.

3,591,971
WATER AERATOR
Troy Tanner, 3104 Emogene St., Mobile, Ala.
Filed July 18, 1969, Ser. No. 842,995
Int. Cl. A01k *97/04*
U.S. Cl. 43—56 **2 Claims**



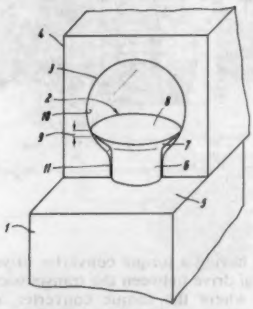
An aerator for aerating water in a bait container, or the like comprising water reservoir permanently or removably mounted on the rim of a bait container. Openings are provided in the walls of the water reservoir for applying a plurality of streams of water to the surface of the water in the bait container to produce aerating bubbles therein.

3,591,972
VERMIN EXTERMINATOR FOR SHIPBOARD USE AND FOR USE IN BUILDINGS, ETC.
Louis Michael Hess, 325 26th Ave. Apt. 302, San Francisco, Calif.
Filed Sept. 22, 1969, Ser. No. 859,772
Int. Cl. A01m *23/16*
U.S. Cl. 43—58 **4 Claims**



A pair of interfitting tubes are formed with entrance holes which are aligned in one position for entry of vermin. The tubes may be moved relative to each other to close off entry. Water flushes vermin trapped in the tubes out the end and into the sea. The tubes may be round, square or rectangular, a smaller tube sliding longitudinally with a larger one.

3,591,973
TOY BUILDING KIT
Artur Fischer, Altheimer Str. 219, Tumlingen, Germany
Filed Mar. 5, 1970, Ser. No. 16,754
Claims priority, application Germany, Mar. 7, 1969, P 19 11 650.8
Int. Cl. A63h *33/08*
U.S. Cl. 46—25 **10 Claims**

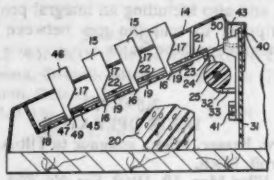


A toy building kit has several structural elements. Some of these have at least one undercut groove in an exposed surface and others have at least one coupling head provided on an exposed surface and matingly engageable with the undercut groove. Such coupling heads each comprise a first portion which projects from the respective structural element and which is provided on its free end remote from the structural element with a second portion resembling a section severed from a sphere in a plane which is at least substantially parallel to the general plane of the exposed face.

3,591,974
MUSICAL TELEPHONE TOY
Ernest L. Thornell, East Aurora, N.Y., assignor to The Quaker Oats Company
Filed Mar. 7, 1969, Ser. No. 805,314
Int. Cl. A63h *33/30*
U.S. Cl. 46—33 **10 Claims**

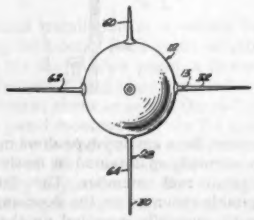
A toy telephone is made to simulate a pushbutton telephone, and the buttons are arranged to drive a music

unit. Also, a popup figure is arranged under a pivotal cradle for the receiver, and one of the buttons moves a cam that



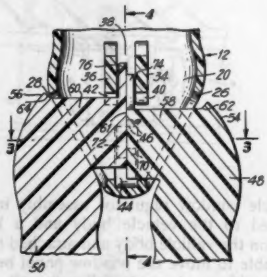
releases a latch to allow the figure to pop up from under the cradle.

3,591,975
INFLATABLE TOY
Nemen M. Terc, 1006 Cherokee Road Apt. 11 G, Portsmouth, Va.
Filed Sept. 18, 1968, Ser. No. 760,545
Int. Cl. A63h *3/06*
U.S. Cl. 46—87 **6 Claims**



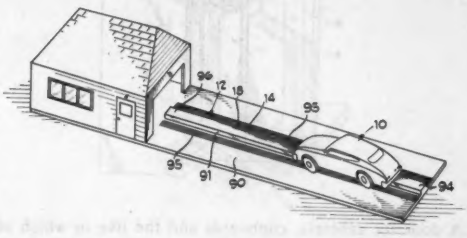
An inflatable toy including a bulbous body of rubbery material adapted to be inflated as a balloon, the body comprising a caricature of a comic figure or satellite or the like and including attachable weight means for arrangement with respect to the body to cause a force substantially equal and opposite to the buoyant force of a lighter than air gas in the body so that the toy is substantially weightless.

3,591,976
WALKING DOLL HAVING LEGS WITH INWARDLY DIRECTED SECTIONS FROM WHICH PROJECTIONS EXTEND FORWARDLY INTO A TORSO GROOVE FOR PIVOTAL MOUNTING OF THE LEGS
Robert K. Ostrander, 497 Prospect St., Maplewood, N.J.
Filed Nov. 18, 1968, Ser. No. 776,502
Int. Cl. A63h *11/00*
U.S. Cl. 46—149 **9 Claims**



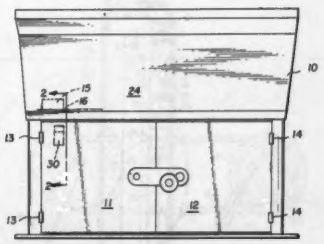
A hollow doll's torso has hip openings which receive inturned portions atop the doll's legs. These portions mount the legs on the torso and have various radial protrusions. One protrusion, forward of the center of gravity of each leg when the leg is vertical, engages a recess in the doll body to form a hinge about which the leg swings forwardly when the torso is erect. The remaining protrusions serve as motion stops and guides in conjunction with formations within the doll's torso. As the torso is rocked side-to-side and advanced, opposite legs alternately pivot forward to simulate walking.

3,591,977
SOUND TOY
Harry Disko, Chicago, and Gunars Licitis, Lombard, both of, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Feb. 27, 1969, Ser. No. 802,920
Int. Cl. A63h *5/00*
U.S. Cl. 46—175 **8 Claims**



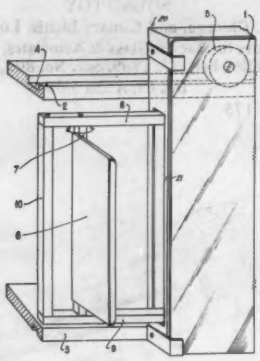
Sound toys comprising toy vehicles having sound reproducing apparatus including a depending stylus extending from the underside thereof, and a track or path having a recorded sound strip along which the vehicles may be manually propelled. The recorded sound strip includes a plurality of closely spaced sound grooves bearing different sound messages and the stylus randomly cooperates with one of the sound grooves as the vehicle is operated along the track.

3,591,978
TOY WITH DOOR-ACTUATED SOUNDER
Theodore L. Bollman, West Falls, N.Y., assignor to The Quaker Oats Company
Filed Mar. 7, 1969, Ser. No. 805,313
Int. Cl. A63h *5/00*
U.S. Cl. 46—175 **5 Claims**



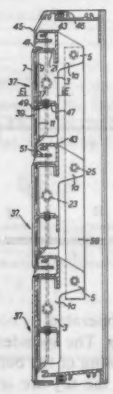
A bellows sounder is operated by both opening and closing a door on a toy building. The sounder comprises a vibrating reed actuated by the closing of the bellows, and a cam on the door and a follower on the toy are arranged for moving the follower on both opening and closing of the door to expand the bellows which then close under spring pressure to generate the sound.

3,591,979
SLIDING DOOR WITH RETRACTABLE SWINGING LEAF
Hugo Laskarin Graber, Laprida St. No. 2051, Buenos Aires, Argentina
Filed Feb. 11, 1969, Ser. No. 798,280
Int. Cl. E06b 7/00
U.S. Cl. 49—70 4 Claims



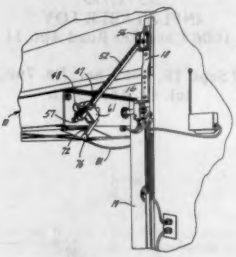
A door for cabinets, cupboards and the like in which at least one sliding door element provided with a mirrored surface carries at least two sliding and swinging side leafs or door elements also provided with mirrored surfaces by means of beams slidably mounted on guides fixed to the rear portion of the door element at different heights so that the side leaves may slide from a fully extended position to a retracted position in which the side leaves are fully concealed behind the front portion of the door element while lying in one and the same plane whereby the thickness of the door element is maintained at a minimum and the extended position of the side leaves at a maximum.

3,591,980
LOUVRE ARRANGEMENTS
Raymond Shu Kwok Cheng, Kowloon, Hong Kong, assignor to The Hong Kong Chiap Hua Mfg. Co. 1947 Ltd., Hong Kong, Japan
Filed May 1, 1969, Ser. No. 820,843
Claims priority, application Great Britain, Feb. 14, 1969, 8156/69
Int. Cl. E05f 17/00
U.S. Cl. 49—91 2 Claims



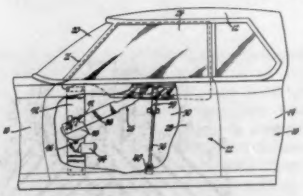
A louvre arrangement comprising a plurality of louvre boards each mounted at their ends by mounting members of thermoplastic materials. The mounting members each including an integral projection, to engage in apertures in a frame of an aperture in a wall which the louvre arrangement is to obstruct, to form bearings about which the louvre boards can be pivoted, and also including an integral projection to form weather stripping to seal the gap between the respective mounting member and the frame.

3,591,981
DOOR OPERATOR
John R. Law, Fraser, Mich., assignor to Tilt-A-Door Corporation, Detroit, Mich.
Filed Mar. 10, 1969, Ser. No. 805,567
Int. Cl. E05f 15/12
U.S. Cl. 49—139 12 Claims



A door operator for a canopy-type door including a small driving pinion normally maintained in meshing engagement with an elongated rack member. The driving pinion is preferably rotatably mounted on the door and the elongated rack is preferably pivotally mounted on the adjacent door frame. Resilient means normally maintain the pinion and rack in meshing engagement whereby the driving pinion, being of small diameter, effective functions as a restraining device to hold the door in a stationary position. Manually releasable means are provided for permitting disengagement of the rack and driving pinion to permit manual operation of the door.

3,591,982
WINDOW REGULATOR
Wayne E. Nantau, Fraser, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 24, 1970, Ser. No. 22,190
Int. Cl. E05f 11/52
U.S. Cl. 49—227 5 Claims



A vehicle window regulator assembly includes a tubular guide fixed to the vehicle body and a lift arm pivotally mounted on the vehicle body and attached to a window panel and operable to move the window panel between raised and lowered positions. A guide follower unit grips the tubular guide at two vertically spaced locations and is connected to the window panel through a telescopeable connection permitting the guide follower unit to extend down below the lower edge of the window panel in the raised position of the latter to increase the lateral stability thereof while assuming a

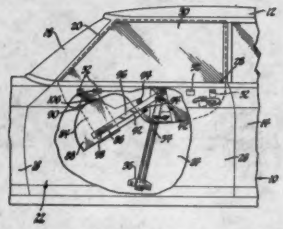
position generally above the lower edge of the window panel in the lowered position of the latter to permit increased downward movement of the window panel.

3,591,983

VEHICLE WINDOW PANEL INSTALLATION

Richard D. Hanson, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1970, Ser. No. 33,258
Int. Cl. E05f *11/52*
U.S. Cl. 49—227 3 Claims



A window panel installation in a vehicle body having a window opening includes a fixed guide member defining a path of motion for the window panel, a follower guided by the guide member and a sash plate mounted on the follower for pivotal movement about an axis of the sash plate and having the window panel mounted thereon for limited universal movement. Pivotal movement of the sash plate relative to the guide member or of the window panel relative to the sash plate effects rotary adjustment of the window panel in its own plane while sequential or simultaneous pivotal movement of both the sash plate and window panel effects longitudinal adjustment of the latter. Transverse or lateral adjustment of the window panel is effected through rocking movement of the window panel relative to the sash plate transversely of the vehicle body.

3,591,984

SLIDING DOOR FITTING COMPRISING A CURSOR FOR GUIDING THE DOOR IN A GUIDE RAIL

Heinrich Lauterbach, Nurnberg, Germany, assignor to Trola-Kunststofferzengnisse Gesellschaft Mit Beschrankter Haftung Und Co., Nurnberg, Germany

Filed June 3, 1969, Ser. No. 829,938
Claims priority, application Germany, June 22, 1968, P 17 59 934.7
Int. Cl. E05d *13/02*
U.S. Cl. 49—410 6 Claims

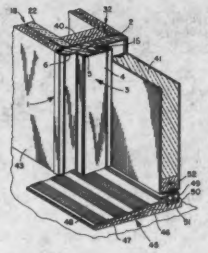
A fitting for a sliding door having a cursor for guiding the door parallel to an undercut slot in a guide rail, the cursor comprising a housing securable in the sliding door and a bolt element having a head, the bolt element being rotatable relative to the housing between a first position, in which the bolt head extends from the housing and can be retained by abutment in the undercut slot, and a second position in which the bolt head can be withdrawn from or inserted in the slot.

3,591,985

PLASTIC-SHEATHED DOOR FRAME

Cary J. Coppins, 13700 Fairhill Road, Cleveland, Ohio

Filed Sept. 30, 1969, Ser. No. 862,168
Int. Cl. E06b *1/08*
U.S. Cl. 49—504 13 Claims



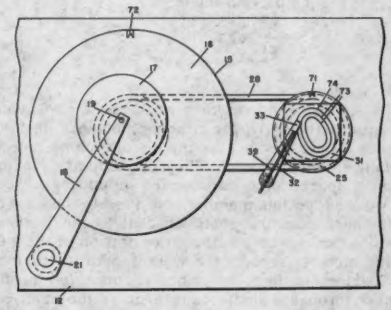
Plastic covering protects the normally exposed inner surface of a door frame from the weather and provides a decorative coating therefor which never needs painting. An additional plastic covering in the form of an elongated plastic extrusion member is attached to the back side of the door frame adjacent the exterior wall and has a rigid plastic strip or fin projecting therefrom covering the joint between the door frame and exterior wood sheeting to provide a drip cap along the top of the door frame and water seal around the entire periphery of the door frame. The plastic fin is offset with respect to its base portion to accommodate the difference in thickness between dry wall and plaster wall for use with either by proper positioning of the fin.

3,591,986

OPTICAL SURFACE GENERATING METHOD AND APPARATUS

Ronald Aspden, Bedford, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Oct. 31, 1969, Ser. No. 873,046
Int. Cl. B24b *7/00, 9/00, 1/00*
U.S. Cl. 51—55 20 Claims



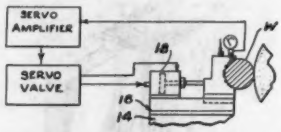
A surface generating system wherein an optical lap is moved over the surface of an optical blank in a path having both circumferential and oscillating radial components. Con-

tinuous and selective variation in the amplitude of the radial component produces desired radially symmetric changes on the work surface and continuous and selective variation in the magnitude of the circumferential component corrects radial asymmetries initially present on the work surface.

3,591,987
WORK FOLLOWER RESTS

Gordon H. Porath, Brighton, Mich., assignor to The Babcock and Wilcox Company, New York, N.Y.

Division of Ser. No. 573,625, Aug. 19, 1966, Pat. No. 3,425,168. Filed Aug. 2, 1968, Ser. No. 749,878
Int. Cl. B24b *41/06*
U.S. Cl. 51—105 R 8 Claims

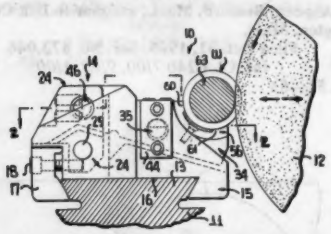


A follower rest which is brought into position adjacent but in spaced relation to the workpiece having a plurality of surfaces, each of which has at least one pressure pad therein. A restrictor is associated with each pressure pad and liquid is provided to each restrictor. When the workpiece is in position adjacent the follower rest and the work performing tool is brought into contact with the workpiece, liquid is supplied to each of the pressure pads and a film of liquid flows continuously at a low velocity between the adjacent surfaces of the follower rest and the workpiece in such a manner that the liquid dissipates its pressure a short distance from the pressure pad.

3,591,988
WORK REST

Ralph E. Price, Waynesboro, Pa., assignor to Litton Industries, Inc., Beverly Hills, Calif.

Filed July 8, 1969, Ser. No. 839,924
Int. Cl. B24b *5/00, 17/00*
U.S. Cl. 51—105 29 Claims

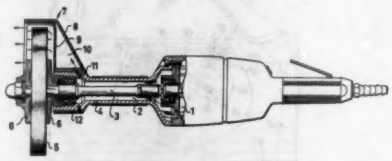


This disclosure relates to a work rest for machine tools, and more particularly, for grinding machines, the work rest includes a base member having a work supporting member pivotally mounted thereon. The work supporting member has angularly spaced shoe portions for supporting a workpiece. The work supporting member is secured to the base member by an inner eccentric shaft adjacent to the work shoe. A second eccentric shaft at the outer portion of the work supporting member secures the work supporting member to a yoke which, in turn, is pivotally connected to the base member through a shaft. Adjustment of the inner eccentric shaft moves the support member in a near-vertical direction, and adjustment of the eccentric at the outer portion of the work supporting member moves the work supporting member in a near-vertical direction. A manually or hydraulically operated shoe mechanism may be included as an integral part of the work rest to control the specific work supporting requirements when large diameters are to be ground or when more than one work rest is required.

3,591,989
HAND GRINDING MACHINES

Jorgen Granlie, Enkoping, Sweden, assignor to Aktiebolaget Bahco, Stockholm, Sweden

Filed Feb. 13, 1969, Ser. No. 798,955
Claims priority, application Sweden, Feb. 20, 1968, 2217/68
Int. Cl. B24b *55/04, 23/00*
U.S. Cl. 51—268 5 Claims

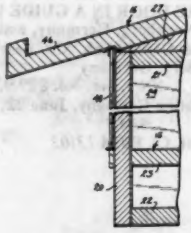


A grinding machine wherein a grinding wheel is rotated by a compressed air-driven motor and wherein sound dampening means is formed in a dust shield which surrounds part of the periphery of the grinding wheel and has an air-outlet passage formed between two peripherally extending parts of the dust shield.

3,591,990
COLLAPSIBLE HOUSING UNIT

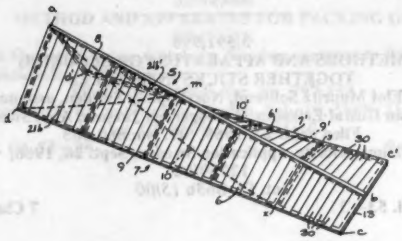
William R. Bergstedt, 28 102 Ave. N.W., Coon Rapids, Minn., and Earl N. Juntunen, Esko, Minn.

Filed Oct. 16, 1969, Ser. No. 866,917
Int. Cl. E04b *1/344, 7/16*
U.S. Cl. 52—67 8 Claims



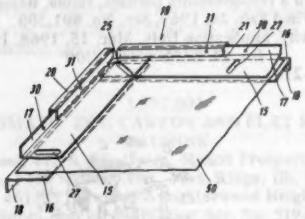
Two rigid, upstanding elongated sidewalls positioned in generally parallel relationship and movable between adjacent and spaced-apart positions, two foldable end walls affixed between the sidewalls at opposite ends thereof, a foldable floor affixed between the sidewalls and a roof having a central inverted V-shaped member with two outwardly projecting extensions thereof hingedly affixed to the central member so as to hang vertically downwardly adjacent the outer surfaces of the sidewalls in the collapsed position and to assume an overlying relationship to the sidewalls in the assembled position. A plurality of struts hingedly connected between the outer surfaces of the sidewalls and the under surfaces of the projecting members of the roof to maintain the roof in an assembled position while the sidewalls are being moved from a collapsed position to the assembled position, the struts forming generally vertically decorative battens on the exterior of the sidewalls and holding the roof in place.

3,591,991
CANTILEVERED ROOF SECTION
Lev Zetlin, 89 Hamilton Drive, Roslyn, N.Y.
Filed June 17, 1969, Ser. No. 834,101
Int. Cl. E04b *1/32, 1/34, 7/14*
U.S. Cl. 52—73 33 Claims



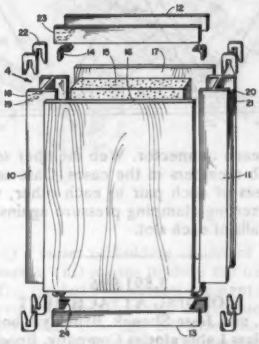
A prefabricatable structural element particularly suitable for use as a cantilevered roof structure capable of spanning large areas and including an elongated curved, preferably hyperbolic-paraboloidal, surface member extending between a linear tension member and a linear compression member not sharing a plane common to the tension member. A tensioned flexible member such as a cable connected at one end thereof to a longitudinally spaced portion of the compression member engages the hyperbolic-paraboloidal surface member at a plurality of predetermined locations intermediate the said tension and compression members. The tensioned flexible cable member conforms at least partly to the curvature of said surface member and cooperates with the surface member and with the linear tension and compression members so as to provide control over the deflection and flutter characteristics of the structure.

3,591,992
WINDOWLIKE STRUCTURAL ELEMENT, PARTICULARLY SUITABLE FOR COVERING HOTBEDS OR FOR THE ERECTION OF BUILDING STRUCTURES
Heinrich R. Pawlicki, Faha East, Bantry, Co. Cork, Ireland
Filed Aug. 22, 1969, Ser. No. 852,201
Claims priority, application Germany, Sept. 6, 1968
G 67 51 880
Int. Cl. E04c *2/38*; E06b *2/54*
U.S. Cl. 52—309 14 Claims



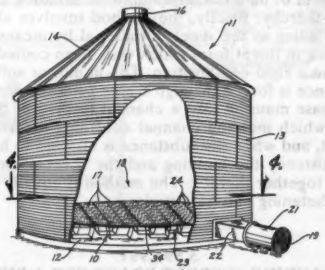
A windowlike structural element assembled of several profile parts in the mechanical assembly technique. The structural element comprises a frame in which a translucent, lightweight windowlike covering of glass or of a plastic material is inserted. Generally, the element includes horizontal and vertical frame portions, each consisting of flat section profiles having bent leg portions, the profiles being joined by a slide-on sleeve. The covering is mounted between the flat sections by fixing means serving to also secure the frame portions and flat sections. Several structural elements may be combined to form a wall or a building structure.

3,591,993
PREFABRICATED WALL UNIT CONSTRUCTION
Troy L. Reeves, St. George, Utah, assignor to Quality Control Builders and Manufacturing Inc., Van Nuys, Calif.
Filed July 18, 1969, Ser. No. 843,103
Int. Cl. E04b *2/16*; E04c *2/10*
U.S. Cl. 52—475 4 Claims



Prefabricated wall units are provided for ready connection in longitudinal alignment by clips receivable over shaped side columns when positioned adjacent to each other. Each unit includes top and bottom channels defining a frame with the columns and a suitable insulating filler. Side panels are provided to complete the prefabricated construction.

3,591,994
OPEN FLOOR SUPPORT
Vincent B. Steffen, New Hampton, Iowa 50659
Filed Dec. 23, 1968, Ser. No. 786,154
Int. Cl. E04h *7/34*
U.S. Cl. 52—648 3 Claims

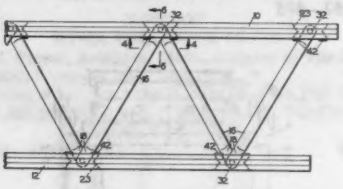


This invention relates to an open support for supporting the perforated floor of the grain-drying bin, the support having a base and a floor-receiving member substantially identical in outline, the base and floor-receiving member being horizontally disposed and vertically spaced, and a plurality of struts connecting the base to the floor-receiving member at the corners thereof.

3,591,995
TRUSS JOIST WITH CLAMP-CONNECTED WEB MEMBERS
Arthur L. Troutner, Skyline Drive, Boise, Idaho
Filed June 13, 1969, Ser. No. 833,092
Int. Cl. E04c *3/292, 3/12*
U.S. Cl. 52—693 12 Claims

A truss joist comprises upper and lower chords having in their opposed faces a staggered pattern of slots with inwardly projecting, reversely tapered end walls. A plurality of clamp connectors are disposed one in each slot. Each clamp con-

nector comprises an outer and an inner hollow case arranged back to back. The end walls of each case have a taper substantially matching the taper of the slot end walls. A plurality of web members are arranged diagonally between the chords with the ends of adjacent web members extending into the

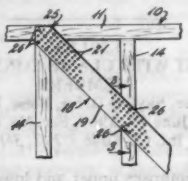


inner case of each connector. Web member securing means secure the web members in the cases. Case securing means secure the cases of each pair to each other, while contemporaneously exerting clamping pressure against the inwardly tapered end walls of each slot.

3,591,996
MOLDING ATTACHMENT
Victor Shanok, and Jesse Shanok, Brooklyn, both of, N.Y., assignors to Glass Laboratories Company, Brooklyn, N.Y.
Filed May 10, 1967, Ser. No. 637,378
Int. Cl. E04f *11/02*
U.S. Cl. 52—716 **1 Claim**

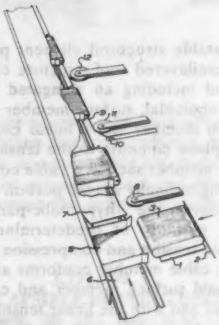
This invention is concerned primarily with providing a novel method of attaching or blind fastening a strip of molding to a sheet of material, and the novel molding attachment produced thereby. Briefly, the method involves affixing the strip of molding to the sheet of material by means of a substance while in fluent form which will, when cooled, cured or set become a rigid composition. The liquid, or soft hardenable substance is forced through a bore or bores provided in a sheet of base material into a channel formed in the strip of molding, which molding channel confronts a surface of the base sheet, and when the substance is allowed to harden to a rigid consistency the molding and the sheet of material are anchored together thereby. The method is equally applicable for blind fastening of other articles.

3,591,997
ANTIRACKING SUPPORT BRACE FOR A BUILDING WALL
James D. Tennison, Jr., 1896 Overton Park Ave., Memphis, Tenn., and Jack C. Tennison, 510 W. Barton, West Memphis, Ark.
Filed June 19, 1969, Ser. No. 834,706
Int. Cl. E04b *2/70;* **E04c** *3/292*
U.S. Cl. 52—657 **1 Claim**



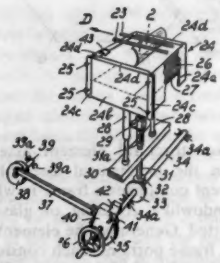
Apparatus applicable to the frame of a building and adapted to brace such frame and thereby stabilize and strength such frame to prevent racking while permitting either exterior or interior siding to be applied. The apparatus includes a sheet metal channel member having multiple openings arranged in a pattern which will insure that several of such openings are in alignment with each portion of the frame that the brace crosses to permit multiple fasteners to connect the brace to each upright frame member as well as to the upper and lower plates of the frame.

3,591,998
METHODS AND APPARATUS FOR SECURING TOGETHER STICKS IN BUNDLES
Soren Elof Mauritz Sollerud, Norrkoping, Sweden, assignor to Goran Gustaf Eriksson, Brabogarden Jursula, Aby, Sweden
Filed Sept. 23, 1969, Ser. No. 860,365
Claims priority, application Sweden, Sept. 26, 1968, 12959/68
Int. Cl. B65b *15/00*
U.S. Cl. 53—3 **7 Claims**



A method and an apparatus by which sticks are secured together in bundles with the aid of a string which is placed in a recess formed in the stick ends. After the string has been placed in the recess the stick ends are deformed adjacent the recess to anchor the string therein. A continuous string can be used, whereby the bundles are mutually connected to each other.

3,591,999
WRAPPING MACHINE FOR SPHEROIDAL BODIES, PARTICULARLY CITRUS FRUIT
Aurelio Mingotti, Imola, Bologna, Italy, assignor to S.A.C.M.I. Cooperativa Meccanici Imola Societa Cooperativa a responsabilita limitata, Imola, Bologna, Italy
Filed Feb. 24, 1969, Ser. No. 801,309
Claims priority, application Italy, Mar. 15, 1968, 1565A/68
Int. Cl. B65b *11/4, 51/00*
U.S. Cl. 53—214 **5 Claims**



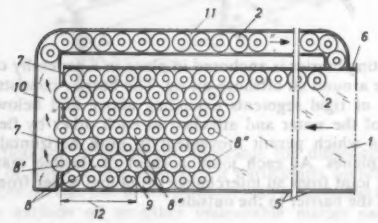
This disclosure relates to a machine for wrapping spheroid bodies, particularly citrus fruit, which includes conveyor means for conveying said bodies above a hopper containing a

pile of sheets of wrapping paper, means for distributing glue onto said bodies and rotating said bodies before their arrival at said hopper, and a closure station for closing the ends of the cylindrical wrappings formed by the adhesive contact between each rotating body and a relative sheet of wrapping paper.

3,592,000
METHOD AND APPARATUS FOR PACKING OF OBJECTS

Erik Gunnar Kapare, Goteborg, Sweden, assignor to Billeruds Aktiebolag, Saffle, Sweden

Filed Feb. 7, 1969, Ser. No. 797,454
Claims priority, application Sweden, Feb. 19, 1968, 2104/68
Int. Cl. B65b *21/06, 35/30*
U.S. Cl. 53—26 **9 Claims**



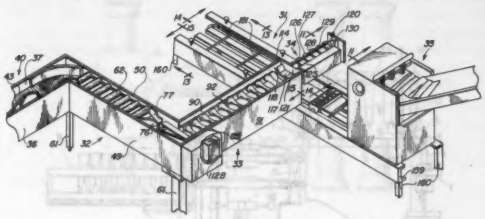
This invention relates to a method for packing bottles, cans or similar objects of essentially circular cross-sectional shape. The object of the invention is to pack the objects such that they require smallest possible space and at the same time support each other such that very stable packages are obtained. This has been achieved in that the objects in a store or store station are arranged in rows of alternating even and uneven number of objects, rows of the greater number being situated along opposite transversal sides of a group of objects formed in said store. The main feature of the invention is to be seen wherein that the bottles are packed in the store, from which they are removed in predetermined groups for being commonly packed, according to a described packing pattern and that a momentarily front row of objects having a lower number of objects is allowed to pass out of the store and then is fed back to take their place once again upon a main conveyor feeding the object of the store. The invention also relates to a machine for carrying said method into effect and being for this purpose provided with stops in the store where the packing pattern is formed, these stops having between them openings through which only the momentarily front row of objects of an uneven number can pass out of the store.

3,592,001
AUTOMATIC EGG CARTON AND FLAT FILLING MACHINE

Elmer Gross, 412 S. See Gwun, Mount Prospect, Ill.; Arthur Schmitz, 1015 Arthur Ave., Park Ridge, Ill., and John H. Hribar, 4615 N. Newland Ave., Harwood Heights, Ill.

Continuation-in-part of application Ser. No. 519,503, Jan. 10, 1966, now abandoned. This application Nov. 26, 1969, Ser. No. 880,291
Int. Cl. B65b *57/12, 35/36*
U.S. Cl. 53—55 **20 Claims**

An egg-orienting and packing apparatus, including (a) an egg delivery mechanism for delivering a row of eggs moving longitudinally by rolling; (b) an egg-orienting section having an endless conveyor of rotating cylinders of such dimension that a single rolling egg may fit alone between a pair of cylinders, and at its downstream end a pair of springlike arms for pivoting each egg with its blunt end downstream; and (c) a transition section, normal to and at the downstream end of the orienting section having an endless conveyor of rotating concave spools, and, at its downstream end, a longitudinal track, for alignment and delivery of the oriented rolling eggs; and (d) an egg row assembling and loading section having (i) a series of rockable track segments extending from the end of the transition section track and controlled to rock a series, starting with the farthest segment, to drop an equal number

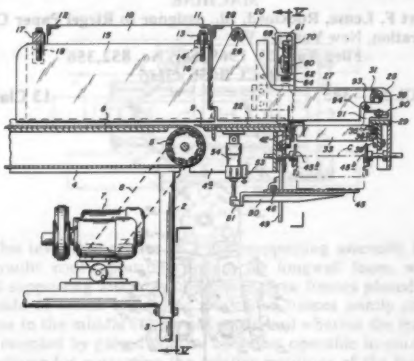


of eggs into (ii) a series of holding chutes of equal number under the segments, (iii) means to drop the number of eggs, immediately after the last and nearest segment is rocked, into a container having a row of cells of equal number, and (iv) means to remove said row and advance another row into receiving position under the series of holding pockets.

3,592,002
DROP-THROUGH CASE PACKER

Frank P. Alduk, 116 Guadalcanal Road, New Castle, Pa.

Filed Feb. 3, 1969, Ser. No. 796,097
Int. Cl. B65b *5/08, 21/06, 35/44*
U.S. Cl. 53—159 **17 Claims**



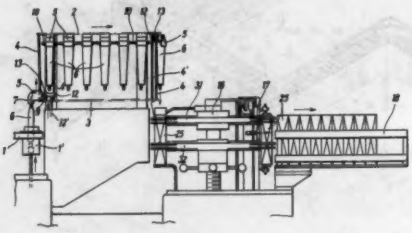
There is disclosed an apparatus for assembling and simultaneously dropping a caseload of containers into the top of an open carton. The device is in the form of an attachment to an existing machine of another type. Bottles, jars, cans or the like are arranged in rows or lanes between parallel guides located over and endless conveyor belt. They move from these lanes between other guides where the bottoms of the containers are supported only on rods carried in a drawerlike frame. When a caseload of containers so supported is positioned between these guides, the forward travel of additional containers is blocked and the drawerlike frame is moved sideways to remove the support from under the caseload and they drop through the frame into a carton positioned therebeneath to receive them. The loaded carton is discharged, the drawerlike frame returned to its starting position, and the restraint is removed from the succeeding containers so that the next caseload is assembled between the guides.

3,592,003

APPARATUS FOR THE PACKING OF FILLED TUBES

Albert Stichhan, Bergstrasse 62, 8550 Forchheim, Oberfranken, Germany

Filed July 22, 1969, Ser. No. 843,729
Int. Cl. B65b *39/12, 43/28*
U.S. Cl. 53—186 26 Claims



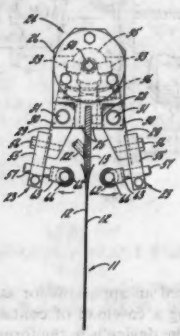
The invention provides apparatus for packing filled tubes, such as toothpaste tubes, in individual rectangular boxes with the end closure fins of the tubes extending diagonally of the boxes. A tube conveyor includes tongs movable in a horizontal endless path and adapted to suspend the tubes by their fins. The tubes are received from a rotary table and transported to a packing station at which the erected boxes are presented by a compartmented wheel. The tongs lower the tubes individually into the boxes at the packing station.

3,592,004

BAG-PRESSING MEMBERS FOR PACKAGING MACHINE

Robert F. Lense, Rockford, Ill., assignor to Riegel Paper Corporation, New York, N.Y.

Filed Aug. 22, 1969, Ser. No. 852,356
Int. Cl. B65b *43/36*
U.S. Cl. 53—385 13 Claims



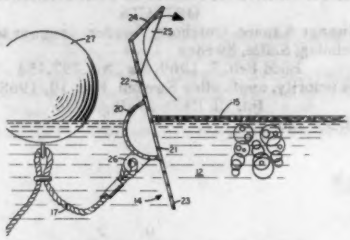
A machine for opening thin, flexible walled bags as the bags are advanced edgewise along a predetermined path in upright positions with the walls of each bag positioned face-to-face and with the upper end portions of the bags straddling a splitter bar. To force the walls of each bag apart, air is expelled through an orifice in the splitter bar and into the bag. In timed relation with the expelling of air into the bag, a pair of pressing members are moved into engagement with the upper end portions of the walls to press the walls against the splitter bar and prevent escape of the air. To move the pressing members into engagement with the bags, an air-operated actuator is mounted on the upper edge portion of the splitter bar and is connected to the pressing members.

3,592,005

OIL BARRIER FOR OFFSHORE OIL RIGS

Eugene C. Greenwood, Newport Beach, Calif., assignor to Fre-Del Engineering Corporation, Santa Ana, Calif., a part interest

Filed Feb. 25, 1969, Ser. No. 801,985
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 10 Claims



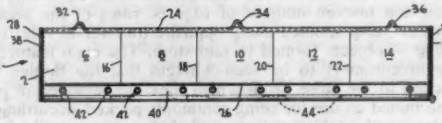
A floating barrier is anchored in place in a generally circular shape around an offshore oil rig. The barrier consists of a plurality of rigid segments extending above and below the surface of the water and attached to each other by flexible couplings which permit movement in both horizontal and vertical planes. At each joint, a sheet of flexible material seals the joint from an interchange of oil and water from the inside of the barrier to the outside.

3,592,006

ISOLATION DEVICE

Arturo M. Crucet, Oklahoma City, Okla., assignor to Cerebro-Dynamics, Incorporated, Oklahoma City, Okla.

Filed Feb. 18, 1969, Ser. No. 800,201
Int. Cl. B63b *35/00*
U.S. Cl. 61—1 11 Claims



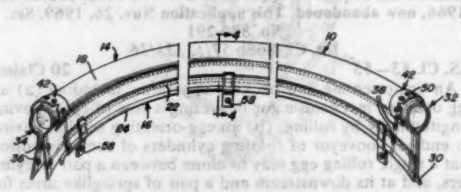
A buoyant isolation device is provided which is capable of confining contamination (e.g. an oil slick) present upon the surface of a body of water while conforming in configuration to surface undulations. The device comprises a buoyant elongated flexible barrier which is provided with a plurality of closed fluid chambers. Through the use of a coupling element having a pair of slots which engage the barrier, contamination confined by the barrier may be readily concentrated prior to subsequent removal.

3,592,007

RETAINER FOR FLOATING DEBRIS

Carl E. Renner, 3824 Rachel, Port Arthur, Tex.

Filed Sept. 5, 1969, Ser. No. 855,530
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 8 Claims



A floating retainer for water carried debris of various types, including liquid debris such as oil from ships, offshore

drilling operations, and the like. The retainer includes an elongated vertically orientatable gathering skirt, the upper edge of which defines an elongated pocket for the reception of buoyant float material. The lower edge defines a ballast-receiving pocket. Interengaging male and female ends are provided in conjunction with joining collars for the tying together of two or more retainers.

3,592,008

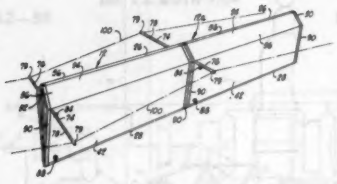
FLOTATION CONFINEMENT APPARATUS

Billie A. Trindle, 8712 S. Youngs, Oklahoma City, Okla.

Filed May 23, 1969, Ser. No. 827,411

Int. Cl. E02b *15/04*

U.S. Cl. 61—1 **1 Claim**



A flotation confinement apparatus for disposition on a body of water which apparatus is particularly useful around offshore oil rigs and in cooperation with a shoreline to retain or to exclude oil or other undesirable matter until such matter can be removed or otherwise eliminated.

3,592,009

LIQUID STORAGE PIT WITH FLOATING COVER

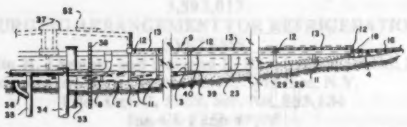
Teunis Glijnis, Alkmaar; Petrus J. Antonissen, The Hague, and Cornelis J. Kamp, The Hague, all of, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed Apr. 29, 1969, Ser. No. 820,165

Claims priority, application Great Britain, May 16, 1968, 23353/68

Int. Cl. B65g *5/00*

U.S. Cl. 61—.5 **11 Claims**



Means for storing liquids including a storage pit having an inclined wall and provided with a floating cover, said floating cover comprising a plurality of buoyant elements movably interconnected in a fluidtight manner.

3,592,010

MINERAL-WORKING EQUIPMENT

Joseph Gaskell, Wigan, England, assignor to Gullick Limited, Wigan, England

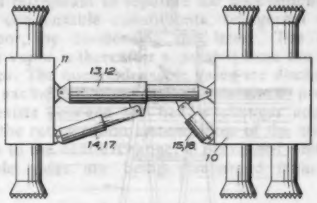
Filed Sept. 16, 1969, Ser. No. 858,417

Claims priority, application Great Britain, Oct. 3, 1968, 46880/68

Int. Cl. E21d *15/44*

U.S. Cl. 61—45 R **7 Claims**

A tool-supporting device for directing or maneuvering mineral-working or like equipment in relation to a mineral face or terrain to be mined or worked with the aid of such equipment, comprises two units, at least one of which is adapted to have a tool mounted on it. Each unit has jack means whereby it can be releasably secured between a floor and roof of a mineworking. Extensible means is provided between the units, said extensible means being operative, using each unit as an abutment or anchorage, to move the other unit relatively thereto. The device also includes steering means between the units for directing such relative movement. In a preferred embodiment of the invention each unit



of the tool-supporting device has upwardly and downwardly directed jack means, the arrangement being such that the jack means of one unit can be retracted to leave said unit supported cantilever fashion from the other unit for movement by the extensible means under the control of the steering means.

3,592,011

ROOF-SUPPORTING ASSEMBLY FOR HYDRAULIC ROOF-SUPPORTING SYSTEM

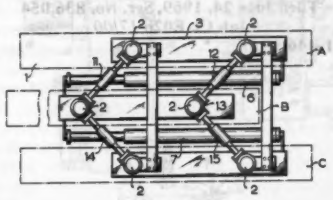
Friedrich-Alexander Brosowski, Castrop-Rauxel, Germany assignor to Klockner-Werke AG Duisburg, Germany

Filed May 1, 1969, Ser. No. 820,808

Claims priority, application Germany, July 1, 1968, P 17 58 448.4

Int. Cl. E21d *15/44*

U.S. Cl. 61—45 **3 Claims**



This invention relates to a roof-supporting assembly for a hydraulic roof-supporting system for longwall faces, which roof-supporting assembly comprises three frames placed side by side of which either the two outer frames jointly or the frame in the middle can be advanced and wherein the frames are coupled by paired control cylinders operable in contrary directions for correcting the relative positions of the frames, the annular piston face in one of each pair of cylinders having the same effective cross-sectional area as the full piston face in the other cylinder and the chamber on the full piston face side in one control cylinder being connected to the chamber on the annular piston face side in the other cylinder for keeping the frames parallel.

3,592,012

LATERALLY REINFORCED OFFSHORE PLATFORM

George E. Mott, Metairie, La., assignor to Texaco Inc., New York, N.Y.

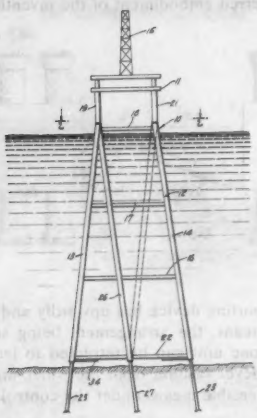
Filed Sept. 23, 1969, Ser. No. 860,285

Int. Cl. E02b *17/00*

U.S. Cl. 61—46 **5 Claims**

An offshore platform adapted to be fixedly positioned at the floor of a body of water. The deck-supporting structure or jacket includes three or more corner legs which extend to, and are fastened into the substratum by piles connected at the respective leg's lower ends. The jacket's upper end is adapted to adjustably or fixedly position a work deck above the water's surface, which deck accommodates the usual equipment such as derricks, draw works and the like, nor-

mally utilized in a well-drilling operation. the deck-supporting jacket is reinforced and stabilized against lateral displac-



ing forces by a series of batter piles held in diagonally positioned pile guides disposed along the respective side faces of said support jacket.

3,592,013

TILTING JACK OFFSHORE PLATFORM

Ivo C. Pogonowski, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed June 24, 1969, Ser. No. 836,054

Int. Cl. E02b *17/00*

U.S. Cl. 61—46.5 **5 Claims**

The invention relates to an offshore platform which includes a work deck having a derrick and other ancillary equipment, normally supported above the water's surface for drilling and producing an underwater well. The support member includes a plurality of elongated legs or columns which operably connect to the deck. Said legs are flared outwardly in a downward direction to define a broad base of substantially greater dimensions than the deck. The respective legs are anchored at their lower ends to the ocean floor and extend above the work deck. The latter can thereby be adjusted to a desired height above the water's surface, stabilized to a desired attitude, or lowered to the water's surface. Each leg is registered in a tiltable jack mechanism, which is in turn operably mounted to a mobile carriage whereby the leg upper end can be adjusted by either/or the tilting or longitudinal movement of said jacking mechanism.

3,592,014

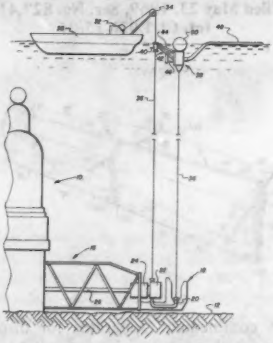
PIPE-CONNECTING SYSTEM FOR THE REMOTE CONNECTION OF PIPE ENDS

Walter Brown, Long Beach, Calif., and Donald E. Smith, Houston, Tex., assignors to North American Rockwell Corporation

Filed Sept. 4, 1969, Ser. No. 855,288

Int. Cl. F16l *1/00*; **E02b** *3/16*; **F16l** *35/00*

U.S. Cl. 61—72.1 **11 Claims**



A pipe-connecting system for the remote connection of a pipe, such as a flowline, where the pipe is guided to an exact position at a remote location and connected, for example, to a pipe connector at a submerged sea station.

3,592,015

RECTIFICATION COLUMN WITH TWO COMPONENT CLOSED HEAT EXCHANGE CYCLE

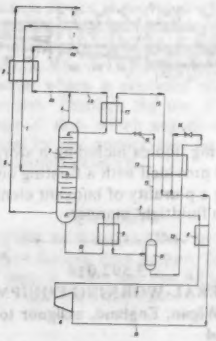
Martin Streich, Niedereschbach, Kreis Friedberg, and Heiner Tanz, Dornigheim (Main), both of, Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Dec. 19, 1968, Ser. No. 785,213

Claims priority, application Germany, Dec. 21, 1967, P 16 19 728.7

Int. Cl. F25j *3/02*, *3/06*, *1/00*

U.S. Cl. 62—28 **11 Claims**



A rectification process for separating mixtures of individual components whose boiling temperatures or vapor pressure curves are far apart wherein for the intensification of the rectification, the column adsorption layer is heated with a circulating gas and the column head is cooled with a circulating gas; is characterized by having as the circulating gas a multicomponent mixture consisting of at least two individual components, by means of which, after it is compressed, the column adsorption layer is heated, whereby the mixture is partially condensed, whereupon it is separated in a separator into a liquid phase with preponderantly difficulty

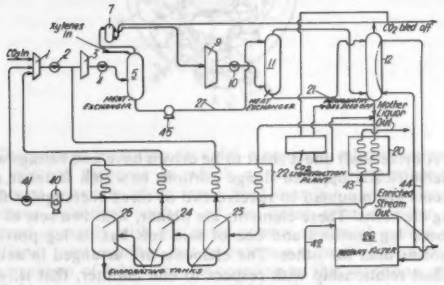
boiling components and into a vapor phase with preponderantly easily boiling components, whereupon the vapor phase through heat exchange is condensed with expanded and vaporizing liquid phase and cools the column head after expansion, and that finally after expansion to the suction pressure and mixing, the original multicomponents mixture is again prepared and conducted to the compressor.

3,592,016

XYLENE ISOMER SEPARATION WITH DIRECT CONTACT GASEOUS CARBON DIOXIDE REFRIGERANT

Bernard Ramsay Bligh, Norton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed July 24, 1967, Ser. No. 655,406
Claims priority, application Great Britain, Aug. 4, 1966, 34,979/66
Int. Cl. B01d *9/04*
U.S. Cl. 62—58 **10 Claims**



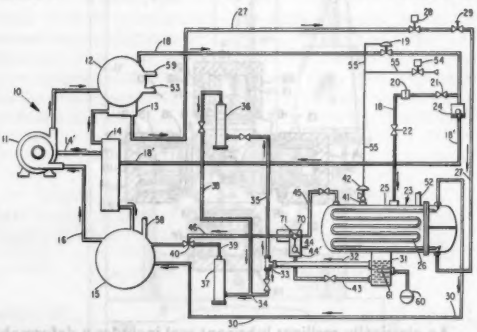
A process for separating a crystallizable component from a liquid by chilling the liquid comprises dissolving in the liquid from the gas phase at an elevated pressure a substantial amount of a gas which is chemically inert to the liquid, chilling the liquid by evaporating at least part of the gas from the liquid at an initial temperature chosen so that crystals of the crystallizable component are formed thereby and separating at least part of the crystallizable component from the system.

3,592,017

PURGING ARRANGEMENT FOR REFRIGERATION SYSTEMS

Martin H. Lipman, and Harland E. Rex, both of Dewitt, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,134
Int. Cl. F25b *47/00*
U.S. Cl. 62—85 **7 Claims**



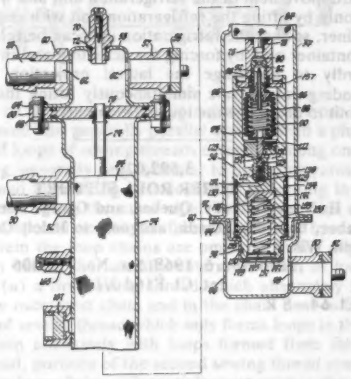
A purging arrangement for a refrigeration system operable to remove noncondensable gases mixed with refrigerant vapor and water vapor from the system to condense the water and refrigerant constituents, to separate condensed refrigerant vapor from condensed water vapor, and to recover a substantial amount of the condensed refrigerant vapor while venting the remaining noncondensables to the atmosphere. The arrangement includes a heat exchanger in which the mixture of noncondensable gases, refrigerant vapor, and water vapor is passed in heat transfer relation with liquid refrigerant to separate the noncondensable gases from the condensable constituents, refrigerant vapor and water vapor, by condensing the latter. The condensed refrigerant vapor is thereafter separated from the condensed water vapor. The noncondensable gases are discharged from the heat exchanger when a predetermined pressure differential exists between the heat exchanger and the condenser of the refrigeration system. Flow of the mixture from the system to the heat exchanger is prevented while the noncondensable gases are being discharged from the heat exchanger.

3,592,018

PILOT OPERATED AUTOMATIC EXPANSION VALVE

Richard E. Widdowson, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 11, 1969, Ser. No. 849,022
Int. Cl. F25b *41/04*
U.S. Cl. 62—222 **5 Claims**



In the preferred form, a vertical receiver housing incorporates a receiver entrance and an outlet fitting at the top and an inlet fitting at the bottom of a vertical evaporator. A coaxial tube extends from the outlet fitting down through the receiver to a pilot control enclosure containing an evacuated pressure responsive bellows provided with a coaxial follower for operating the pilot valve in accordance with the outlet pressures. The pilot valve controls the flow of high-pressure liquid from the receiver to the pistonhead of the piston slotted sleeve valve which forms the main valve to control the flow of liquid refrigerant from the receiver into the bottom inlet fitting of the evaporator. This pilot control arrangement controls the outlet pressure within a very small differential between idling and maximum speed of the compressor.

3,592,019

QUICK LOCK ASSEMBLY FOR REFRIGERATOR UNIT

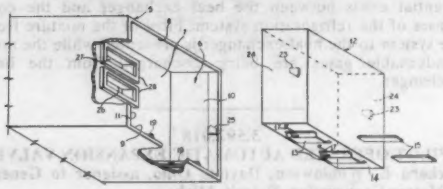
Maurice Beaudet, St. Laurent, Montreal, Quebec, Canada, assignor to Galt Equipment Ltd., Candiac, Quebec, Canada

Filed Aug. 29, 1969, Ser. No. 854,203
Claims priority, application Great Britain, May 28, 1969, 27070/69
Int. Cl. F25d *19/00*
U.S. Cl. 62—298 **11 Claims**

A device for locking a refrigeration unit into a recessed end of a shipping container. The novel feature comprises a special locking arrangement which is entirely activated by means of the forks of a forklift truck.

The locking arrangement includes (a) at least one actuat-

ing arm pivotally mounted on the bottom of a refrigeration unit, said actuating arm being spring biased in a normally downward position and including at least one lateral locking projection adapted to engage a catch in the shipping container when the actuating arm is in the downward position and prevent either upward or outward movement of the refrigeration unit with respect to the container and further adapted to release from the catch only by an inward and upward push of the actuating arm against the resistance of the



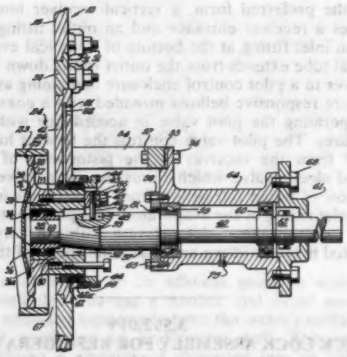
spring and (b) interengaging elements on the refrigeration unit and shipping container recess which normally prevent outward movement of the refrigeration unit and which disengage only by lifting the refrigeration unit with respect to the container, so that the refrigeration unit can be released from the container only by forcing the actuating arm inwardly and upwardly to disengage the lateral projection from corresponding catch while simultaneously lifting the refrigeration unit to disengage the locking elements.

3,592,020

RECTIFIER ROLL SUPPORT

James H. Brewer, Tracy, Quebec, and George Forrest, Sorel, Quebec, both of, Canada, assignors to Beloit Corporation, Beloit, Wis.

Filed Nov. 6, 1968, Ser. No. 773,806
Int. Cl. F16d *3/16*
U.S. Cl. 64—8 R **5 Claims**



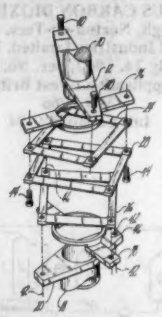
A rectifier roll employs a hub insert assembly to provide positive alignment of the roll and journal for eliminating any eccentricity which would result in roll bounce or run out and a pivotal drive engagement of the hub which permits the roll to deflect without imposing severe stress or strain on the separator tips which attach the end plate of the roll to the cylindrical shell of the roll.

3,592,021

FLEXIBLE COUPLING

Robert J. Mayerjak, Torrington, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Continuation-in-part of application Ser. No. 746,526, July 22, 1968, now Patent No. 3,481,158. This application June 30, 1969, Ser. No. 837,461
Int. Cl. F16d *3/62*
U.S. Cl. 64—12 **12 Claims**



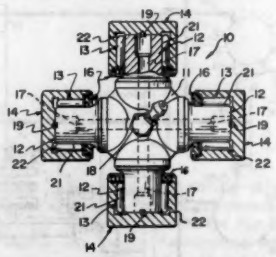
A drive shaft and a shaft to be driven have end fittings with diametrically opposed flange portions in which fastener elements are mounted to receive two of three rectangular flexing elements. These elements are planar, with two sets of opposed leg portions and one of said sets has its leg portions shorter than the other. The elements are arranged in axially offset relationship with respect to one another, that is, with alternate diagonal, or radially extending planes defined by their interconnected corners or vertices, angularly spaced with respect to the axis of rotation of the coupling to permit minimizing the axial length thereof and to nevertheless provide sufficient clearance between the adjacent fastener elements during misalignment of the shafts. A pair of torsion members are arranged adjacent each of the end fittings and their associated flexing elements, said torsion members being disposed at approximately right angles to the end fittings and being connected to the associated flexing elements by fastener elements connecting an additional flexing element intermediate the elements associated with the drive and the driven end of the coupling.

3,592,022

LUBRICANT SEAL

Raymond E. Stokely, Rockford, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 15, 1969, Ser. No. 885,229
Int. Cl. F16d *3/41, 3/16*
U.S. Cl. 64—17 A **3 Claims**



An elastically resilient lubricant seal includes a deformable shoulder portion for interference fitted engagement with a bearing cup and has a purging channel extending through part of the shoulder to define a purging lip. Elastically resilient sidewalls of the channel provide a bias for the lip

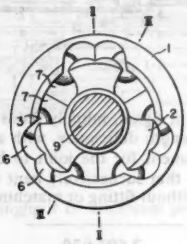
which is independent of the fit between the seal and cup. A hinged shield portion is provided for protecting the lip from external contaminants.

3,592,023

CONSTANT VELOCITY UNIVERSAL JOINT

Hideo Okoshi, Fujisawa-shi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed June 24, 1969, Ser. No. 835,960
Claims priority, application Japan, June 27, 1968, 43/44188
Int. Cl. F16d *3/30*
U.S. Cl. 64—21 1 Claim



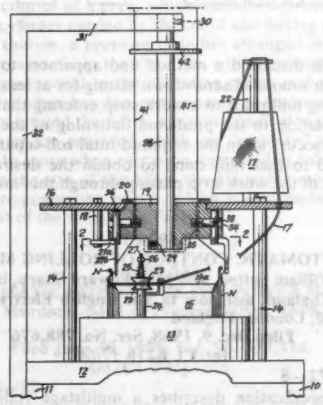
The present invention provides a constant velocity universal joint of the type in which an outer joint member is disposed coaxially of an inner joint member and the inner concave spherical surface of the outer joint member is formed coaxially with the outer convex spherical surface of the inner joint member, but no retainer is used which avoids the problem of lubrication. According to this invention, the balls for transmitting power are held in the grooves intersecting with each other and provided in said two members, respectively, and the balls lie in the plane bisecting the angle between the axes of the drive and driven shafts. One-half the working angle β is selected to be less than the angle α of inclination so that the torque transmission is not abruptly reduced. The cross section of said groove is a simple arcuate curve, the machining of the grooves is much facilitated.

3,592,024

MACHINE FOR PRODUCING TUBULAR ELASTIC NETTING

Nathan Levin, 722 Edgewood Ave., Trenton, N.J.

Filed May 21, 1968, Ser. No. 730,775
Int. Cl. D04b *9/16, 15/50*
U.S. Cl. 66—9 1 Claim



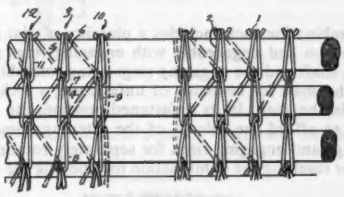
A latch needle multifeed circular-knitting machine having means to knit chain stitches of individual inelastic warp yarns on each of a circle of spaced needles at each of the feeds of the machine to form a circle of spaced chain stitch warp strings and having means to feed tensioned elastic yarn to the needles below their opened latches at one feed of the machine whereby the elastic yarn is castoff and is incorporated unknit in spaced chain stitches of the circle of warp strings to produce circular knit tubular openwork elastic mesh netting or fabric. Each yarn is fed to a needle by an L-shaped finger attached to a finger shaft the axis of which is located within the needle circle so that the finger moves back and forth across the needle circle and around the needle to feed the yarn thereto.

3,592,025

WARP KNIT FABRIC CONTAINING LOOSE FILLING

Ned K. Sharpe, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Nov. 9, 1967, Ser. No. 681,702
Int. Cl. D04b *23/10*
U.S. Cl. 66—192 1 Claim



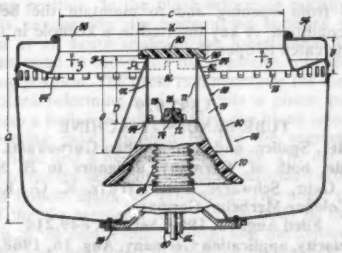
A fabric of the type comprising a plurality of loose filling yarns gathered into generally parallel clusters with a plurality of chains of loops of sewing threads extending along one side of the filling, generally perpendicular to the filling yarns, with sewing thread connecting between loops extending through the filling and along the other side. The loop chains are in sewn bands spaced across the fabric, separated by unsewn bands wherein the loop chains are omitted. At the edges of the unsewn bands, the laterally outermost chain of loops is formed of (a) a first sewing thread which alternately forms loops in the outermost chain and in the chain next to it, and (b) a second sewing thread which only forms loops in the outermost chain alternately with loops formed from the first sewing thread, portions of the second sewing thread connecting between loops being substantially taut against the other side of the filling and in line with the outermost chain of loops.

3,592,026

WASHING MACHINE AGITATOR

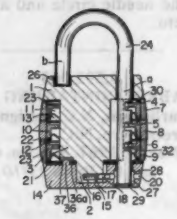
Richard R. Walton, Boston, Mass., assignor to General Motors Corporation, Detroit, Mich.

Filed June 9, 1969, Ser. No. 831,423
Int. Cl. D06f *17/10*
U.S. Cl. 68—134 2 Claims



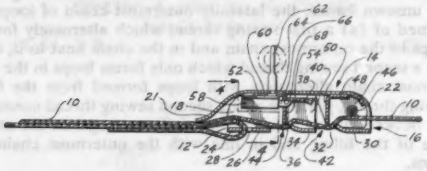
A domestic clothes washer has a tub with a top opening. An agitator is adapted to reciprocate vertically within the tub and includes a frustoconically shaped, single cone providing clothes immersion and turnover.

3,592,027
COMBINATION LOCK
Shigeru Wako, Tokyo, Japan, assignor to Wako Kinzokie Kabushiki Kaisha, Tokyo, Japan
Filed Sept. 22, 1969, Ser. No. 859,909
Claims priority, application Japan, Sept. 30, 1968, Sept. 30, 1968, 43/85129;43/85130
Int. Cl. E05b *37/14, 37/02, 67/22*
U.S. Cl. 70—25 6 Claims



A combination lock includes a plurality of dial rings each mounted on and engageable with engaging rings positioned about a shaft and the engaging rings being rotatably movable about the shaft for fastening or unfastening a lock bail positioned in the shaft. In its unfastened position, the lock is arranged to afford the release of the interengagement of the dial rings and engaging rings for separately rotating the dial rings for resetting the combination for opening the lock.

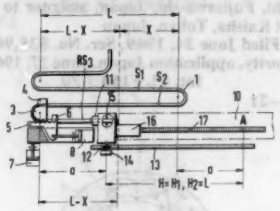
3,592,028
RESTRAINING BELT BUCKLE WITH LOCK
Joseph B. La Monica, Orange, Calif., assignor to John T. Posey d/b/a J. T. Posey Company, Pasadena, Calif.
Filed Oct. 6, 1969, Ser. No. 863,918
Int. Cl. E05b *65/00;* A44b *11/12*
U.S. Cl. 70—57 12 Claims



A buckle at the end of a belt has a clasp that pivots open with respect to a base to allow the belt to be drawn through the buckle. When the clasp is closed, a bladelike clamp on the underside of the clasp cooperates with a closely spaced, upwardly projecting belt-retaining member in the base of the buckle to tightly crimp the belt. A catch from a lock on the underside of the clasp abuts against the underside of a retaining member in the buckle when the clasp is closed to prevent the clasp from opening and to maintain the belt in its crimped condition. A key inserted in a keyhole in the clasp retracts the catch to open the clasp.

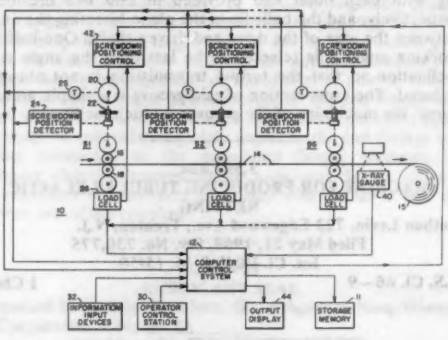
3,592,029
TUBE-BENDING MACHINE
Erich Ritter, Spellen, and Ranganathan Guruswami, Cologne Holweide, both of, Germany, assignors to H. Schwarze Sohne; Gebr. Schwarze, Peter, Wirtz, K. G., Koln-Merheim, Cologne-Merheim, Germany
Filed Aug. 11, 1969, Ser. No. 849,214
Claims priority, application Germany, Aug. 16, 1968, P 17 52 977.0
Int. Cl. B21b *37/14;* B30b *15/26*
U.S. Cl. 72—7 10 Claims

In a fully automatic cold tube-bending machine for production of serpentine coils from straight tubes of random lengths, a tube feeder not only measures the tube feed between successive bends, but also, after the last bend in any given tube, senses the tube end and measures the residual terminal length or the deficiency from the length to the next succeeding bend in a desired larger coil, and, by generating a



corresponding control signal, initially feeds the next tube by the amount of the length deficiency, with allowance for any tubing length adjustment for the joint to be made between successive tubes; so that successively bent tubes may be appropriately joined without fitting or matching operations.

3,592,030
ROLLING MILL STAND SCREWDOWN POSITION CONTROL
Andrew W. Smith, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed June 5, 1969, Ser. No. 830,636
Int. Cl. B21b *37/00*
U.S. Cl. 72—8 14 Claims

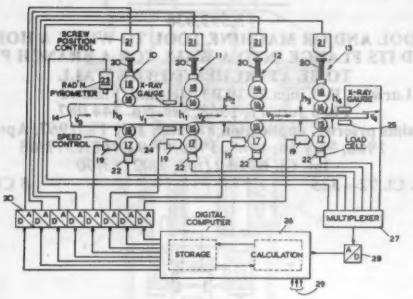


There is disclosed a method and apparatus to determine the proper unloaded screwdown setting for at least one stand of a rolling mill prior to a work strip entering that mill stand and in relation to the predicted flattening of the work rolls that will occur, when the required total roll-separating force is applied to that mill stand to obtain the desired delivery thickness of the work strip passing through that mill stand.

3,592,031
AUTOMATIC CONTROL OF ROLLING MILLS
Robert William Sutton, and John Edward Sharp, both of Stafford, England, assignors to The English Electric Company Limited, London, England
Filed Dec. 9, 1968, Ser. No. 788,676
Int. Cl. B21b *37/00*
U.S. Cl. 72—8 10 Claims

The specification describes a multistage rolling process which is controlled by a computer to reduce the thickness of a piece of deformable material from a known initial thickness to a desired final thickness. Using the terminal thicknesses and other known or assumed characteristics of the material,

the computer derives values for the rolls separations in the stages for achieving an optimum value for a parameter such as maximum throughput or minimum power for the process as a whole.

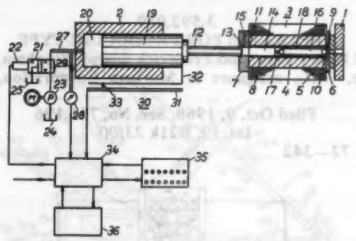


3,592,032

CONTROL MEANS FOR HYDROSTATIC EXTRUSION

Ingemar Stromblad, Vasteras, Sweden, assignor to Allmanna Soenska Electriska Aktiebolaget, Vasteras, Sweden

Filed June 30, 1969, Ser. No. 837,537
Claims priority, application Sweden, July 2, 1968, 9077/1968
Int. Cl. B21c *31/00*
U.S. Cl. 72—20 **10 Claims**



For the control of a press which includes a press stand, an operating cylinder carried by the stand and having an operating piston therein, a pressure chamber arranged in the stand and an extrusion die in the chamber, with a pressure-generating punch connected to the operating piston and inserted in the pressure chamber for compressing a pressure medium isostatically around the billet, a position indicator and a pressure indicator are provided which are connected to a calculating unit to sense when extrusion starts and to calculate, depending on the size of the billet, the allowable movement of the pressure-generating punch, which is interrupted just before the last of the billet is extruded.

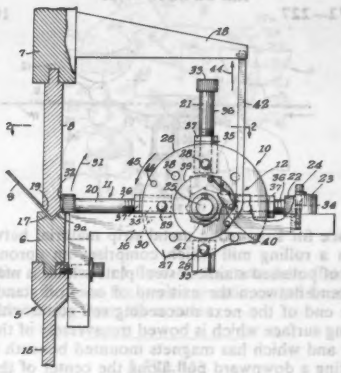
3,592,033

AUTOMATIC STOP GAUGE FOR POWER MEANS

Donald F. Murdoch, 5441 S. Norwalk Blvd. No. 8, Whittier, Calif.

Filed June 30, 1969, Ser. No. 837,414
Int. Cl. B21j *7/26*
U.S. Cl. 72—22 **4 Claims**

A rotational unit mounting a plurality of stop gauges and connected to the ram of a power brake and intermittently advanced by the ram each time the same retracts after performing a bending operation on a sheet metal member, thereby replacing the stop gauge that had been in operative position with the next stop gauge on the rotational unit so that the same serves as a stop gauge for the next position of the metal member prior to the next bending operation on the metal member.

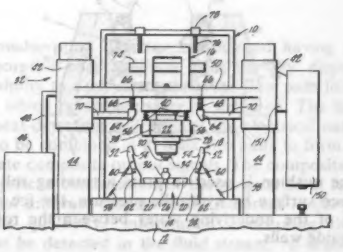


3,592,034

APPARATUS FOR FORMING ARTICLES

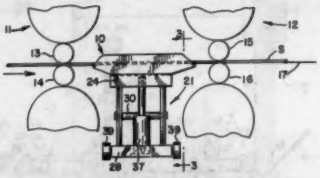
Forrest H. McMeen, Arcadia, and William F. Gresham, San Clemente, both of, Calif., assignors to VSI Corporation, Pasadena, Calif.

Filed Oct. 21, 1968, Ser. No. 770,893
Int. Cl. B21d *26/08*
U.S. Cl. 72—58 **14 Claims**



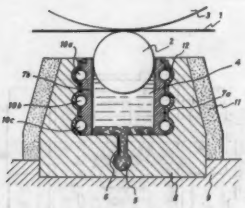
Die segments in a die body are movable between a normally open blank-receiving position and a closed blank-reforming position. In the blank-reforming position, the die segments engage the die body along surfaces which are disposed at an acute angle to the longitudinal axis of the press ram used to move the die segments into their blank-reforming position. The press ram maintains the die segments in the blank-reforming position while a piston punch fluid pressurizes a hollow blank to reform the blank into the shape of a forming cavity defined by the die segments, a die stripper head and a neck die of the ram. The die stripper is coupled to the die segments to eject a reformed article and to accept a hollow blank for reforming. The angle of engagement of the die segments with the die body to the longitudinal axis of the ram is small enough that the amount of force which the ram must exert to keep the die segments together is relatively low. A pump coupled to the press ram is capable of providing additional pressurization of the hollow blank in the event that the piston punch is incapable of displacing sufficient liquid to effect the high-pressure required for reforming.

3,592,035
STRIP TRANSFER DEVICE
Dario Buccicone, Gary, Ind., assignor to Bucciconi Engineering Co., Inc., Gary, Ind.
Filed Mar. 17, 1969, Ser. No. 807,691
Int. Cl. B21b *41/00*
U.S. Cl. 72—227 10 Claims



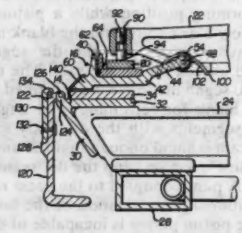
A device for supporting metal strip material between roll stands in a rolling mill which comprises an apron forming member of polished stainless steel plate which is mounted so as to extend between the exit end of one roll stand and the entrance end of the next succeeding roll stand with a sheet supporting surface which is bowed transversely of the path of the strip and which has magnets mounted beneath the same for exerting a downward pull along the center of the strip as it advances across the apron so that the traveling strip will be bowed and stiffened to prevent sagging between the roll stands. An antifriction means may be provided in the center of the apron such as skate rollers or an air cushion.

3,592,036
METHOD AND APPARATUS FOR PRESSING A ROTATING ROLL AGAINST A SURFACE
Paul Blain, Saint Germain-en-Laye, France, assignor to Institut de Recherches de la Siderurgie Francaise, Saint Germain-en-Laye, France
Filed July 15, 1969, Ser. No. 841,949
Claims priority, application France, July 23, 1968, 160174
Int. Cl. B21b *31/32*
U.S. Cl. 72—245 9 Claims



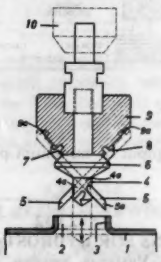
An ice cushion is used to press a rotating roll against a workpiece surface by hydraulic pressure, the ice preventing leakage of the underlying water between the roll and adjacent guide walls.

3,592,037
SHEET METAL BENDING BRAKE
Eugene H. Van Cleave, Redford, Mich., assignor to Van Mark Products Corporation, Detroit, Mich.
Filed Jan. 27, 1969, Ser. No. 794,326
Int. Cl. B21d *11/04*
U.S. Cl. 72—319 8 Claims



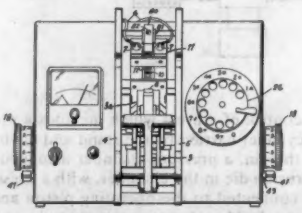
A sheet metal bending brake having spaced upper and lower support arms with a base member fixed to the lower arms and a clamping member pivoted to the upper arms and aligned with the base member. The clamping member is normally held in a released position by biasing springs and is pivoted to a locked position by a slidable locking member guided on the clamping member and having cams engaging antifriction lugs extending below the upper support arms.

3,592,038
TOOL AND/OR MACHINE TOOL TO WORK A HOLE AND ITS FLANGE INTO A WALL FOR A BRANCH PIPE TO BE ATTACHED TO THE WALL
Leo Larikka, IV Linga 17-19 B3, Helsinki, Finland
Filed July 11, 1968, Ser. No. 744,087
Claims priority, application Finland, July 11, 1967, Apr. 4, 1968, May 16, 1968, 1905/67;929/68;1379/68
Int. Cl. B21d *31/02, 1/02, 53/00*
U.S. Cl. 72—325 5 Claims



The formation of a hole and a flange surrounding the hole in a wall and to which flange a branch pipe is attached including a drill provided with at least two elements which, following the drilling of the hole are capable of being extended to a location under the edge of the hole so that upon withdrawal of the drill the elements coact to form a projecting flange at the edge of the hole.

3,592,039
APPARATUS FOR PRODUCING TYPE
Richard Henry Frye, and Frederick Joseph Bingham, both of Keene, N.H., assignors to Markem Corporation, Keene, N.H.
Filed Oct. 9, 1968, Ser. No. 766,196
Int. Cl. B21k *23/00*
U.S. Cl. 72—342 1 Claim

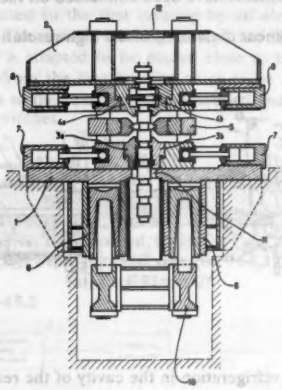


This disclosure relates to a manually operated apparatus which produces a bar or line of letterpress type characters. The desired legend can be mechanically established through a dial-type input linkage preparatory to actuation for preparing the typebar. This apparatus is especially suited to the preparation of typebars on which the character legend varies from slug to slug.

3,592,040
DEVICE FOR FORGING CRANKSHAFTS AND THE LIKE
Gabriel Ruget, St. Etienne, France, assignor to Compagnie Des Ateliers Et Forges De La Loire St. Chamond, Firminy, St. Etienne, Jacob-Holtzer, Paris, France
Filed Aug. 22, 1968, Ser. No. 754,658
Claims priority, application France, Sept. 7, 1967, 120,268
Int. Cl. B21j *9/02*
U.S. Cl. 72—399 7 Claims

A device for forging crankshafts having a plurality of throws disposed in different angular positions by carrying out the method consisting in upsetting one portion of a cylindrical initial blank either plain or formed with swellings, by ex-

erting two oppositely directed efforts on the zone heated to the forging temperature, and by applying an effort perpendicular to the aforesaid oppositely directed efforts, in offsetting the intermediate portion of the initial bar. The offset portion constituting a crankpin, and the upset portions constituting two cheeks of the crankshaft to be forged.

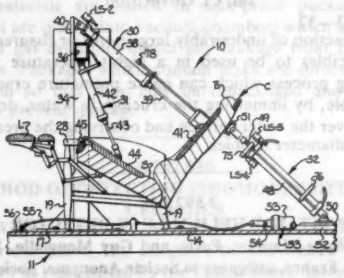


3,592,041

CHAIR-TESTING APPARATUS

William H. Spencer, Vale, N.C., assignor to Burris Manufacturing Compnay, Lincolnton, N.C.

Filed Oct. 25, 1968, Ser. No. 770,590
Int. Cl. G01n *3/56*; G01m *19/00*
U.S. Cl. 73—7 11 Claims



A chair-testing apparatus for testing the operability and/or durability of the elements and construction of a reclining chair, including means for applying forces to movable seat, back and leg rest portions of a chair under test and thereby simulating use of the chair by an occupant be causing the movable portions to cycle between a generally upright seating position and a generally inclined reclining position and further including means for engaging occupant-supporting surfaces of a chair under test to simulate wear imposed thereon by an occupant seating himself in the chair and arising from the chair. Testing sequences are under the control of a control means governing the cycling of forces applied to portions of the chair under test in such a manner as to permit full simulation of use of the chair by an occupant or suspension of certain test functions as may be desired.

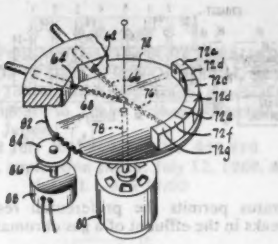
3,592,042

FLUIDIC INDICATING DEVICE

Esteban Martinez, 206 Brunswick Ave., Lambertville, N.J.

Filed Dec. 23, 1968, Ser. No. 786,157
Int. Cl. G01n *33/00*; F15c *4/00*
U.S. Cl. 73—23 11 Claims

An indicating device is provided with two nozzles positioned at an angle with respect to each other through which fluids are passed to form a common fluid stream and means contacted by the common fluid stream are utilized for indicating the direction of flow of the common fluid stream which in turn indicate the pressure ratio or other conditions of the fluids issuing from the nozzles.

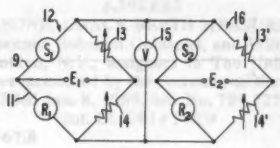


3,592,043

MICRO-ADSORPTION DETECTOR AND METHOD OF USING SAME

Miner Nelson Munk, Walnut Creek, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Jan. 27, 1969, Ser. No. 793,948
Int. Cl. G01n *31/08*, *11/00*
U.S. Cl. 73—23.1 7 Claims



A microadsorption detector is disclosed having at least three adsorption-heat-detection cells serially disposed in close proximity to each other along the flow path for a fluid stream in which constituents are to detected. The third adsorption-heat-detection cell permits the electrical outputs of the cells to be combined in at least two pairs to form at least two separate composite output signals. The composite signals each comprise a combination of the outputs of at least two cells. Use of different adsorptive fill materials in the pairs of cells yields qualitative information concerning the constituents to be detected in the fluid stream. At least one of the cells would normally be filled with a relatively inert, nonadsorptive material and serve as a reference cell to compensate for extaneous temperature changes common to all the cells. Four or more cells can be arranged to compensate for flow sensitivity. The signal from one pair of cells, both members of which are filled with the same type of adsorptive material, will compensate that part of the signal from other pairs of cells which is due to change in flow rate.

3,592,044

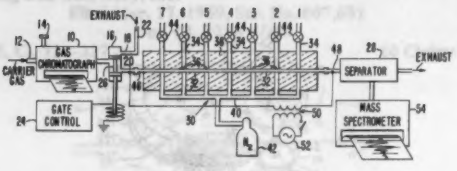
SAMPLE HANDLING MEANS FOR USE IN GAS ANALYSIS APPARATUS

Donald E. Green, Sunnyvale, and Duane P. Littlejohn, Santa Clara, both of, Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Aug. 1, 1968, Ser. No. 749,383
Int. Cl. G01n *31/08*; B01j *17/28*
U.S. Cl. 73—23.1 12 Claims

A gaseous sample handling apparatus utilizing the principles of condensation and revaporization to allow selected quantities of sample to be temporarily stored within the flow path connecting a gas chromatograph and a gas analyzer so

that the samples can at some later time be reintroduced into the flow stream at predetermined mass flow rates. Likewise,



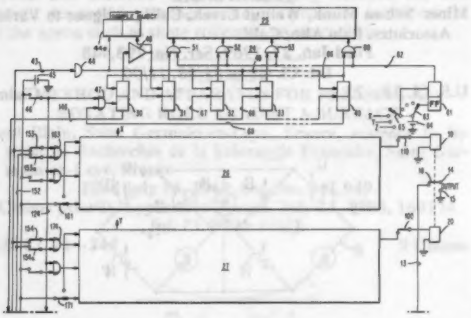
the apparatus permits the preferential reshaping of constituent peaks in the effluent of a gas chromatograph.

3,592,045

PROCESS ANALYSIS PROGRAMMER

Edward L. Weiss, Quakertown, Pa., assignor to Leeds & Northrup Company, Philadelphia, Pa.

Filed Dec. 12, 1968, Ser. No. 783,283
Int. Cl. G01n *31/08*; **G06f** *15/20*
U.S. Cl. 73—23.1 **17 Claims**



A digital programmer adapted to program functions in chromatography, uses a function counter to actuate each of the functions and a master counter as the cycle clock, all operable from a single-pulse generator. During a setup cycle, each function counter is started when its function occurs. Alternatively, reversible counters are started in reverse counting at time zero, and stopped at the desired time of the function during the setup cycle. In subsequent cycles, the zero count of that counter is used to program its corresponding function. The count in any function counter may be altered relative to the master counter during subsequent cycles for program updating or error correction, either manually or automatically.

3,592,046

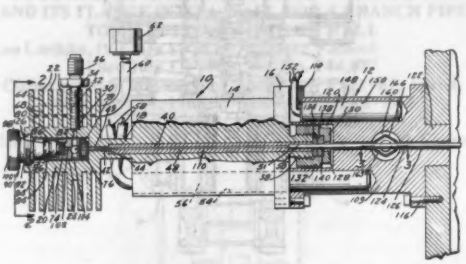
PRECOLUMN INLET FOR CHROMATOGRAPHS

Carol A. M. G. Cramers, La Habra, Calif., and Mateus M. Van Kessel, Breukelen, Netherlands, assignors to Hamilton Company, Whittier, Calif., by said Van Kessel

Filed Feb. 27, 1969, Ser. No. 848,372
Int. Cl. G01n *31/08*
U.S. Cl. 73—23.1 **10 Claims**

Removable precolumn inlet apparatus for direct injection into high resolution packed or capillary columns for chromatographs. A front body and a rear body, the front body being removably attached to the rear body and contains a hot zone where evaporation of samples occur and an air-cooled zone in which sealing septums are disposed. A precolumn tube is disposed in the front body which is heated so that samples are evaporated in said tube. A separatory column of high revolving ability is operably connected to the precolumn tube, said rear body having a cavity in which a short length of the high-resolution column extends, said short length of the high-resolution column being refrigerated, there being a cold shield in the cavity to reduce the heat loss of the rear body when refrigeration is taking place. The rear body also acts as a heat source for rapidly warming up the cold zone after the sample components have been condensed on the head end of the column.

The short linear dimension of the high-resolution column is



subjected to refrigeration in the cavity of the rear body so as to condense the sample components and thereby provide a sharp sample injection into the continuing high-resolution column when refrigeration is turned off. The surrounding heat block of the rear body provides a large thermal mass to rapidly bring the capillary column segment back up to column temperature.

3,592,047

GRAPHITE CRUCIBLE TEST METHOD

John T. Carleton, Williamsville, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 26, 1969, Ser. No. 853,197
Int. Cl. G01m *3/06*
U.S. Cl. 73—37 **1 Claim**

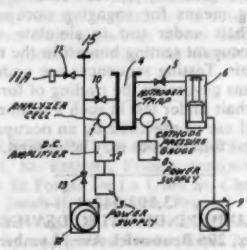
The detection of undesirably large pores or fissures in graphite crucibles to be used in a high-temperature vacuum metallizing process which can cause premature cracking of the crucible, by immersing the crucible in water, drawing a vacuum over the water surface and observing the presence of any large diameter bubbles.

3,592,048

PORTABLE HELIUM LEAK DETECTOR

Louis Philippe Maurice, Paris, and Guy Mongodin, Fresnes, both of, France, assignors to Societe Anonyme: Societe Alsacienne de Constructions Atomiques de Telecommunications et D'Electronique "Alcatel", Paris, France

Continuation of application Ser. No. 614,682, Feb. 8, 1967, now abandoned. This application June 27, 1969, Ser. No. 858,553
Int. Cl. G01m *3/16*
U.S. Cl. 73—40.7 **1 Claim**



The device concerns a portable helium leak detector wherein a first housing has the analyzer cell, the vacuum producing units and a vacuum connection arrangement to

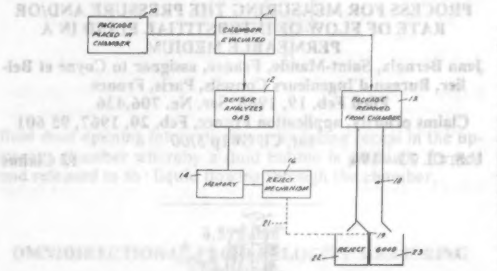
feed gas from the apparatus or arrangement that is being tested for leaks. If the helium gas to the unit being tested leaks and is fed to the analyzer cell, it will determine such to provide a signal. The second housing has the electronic portions, the indicating means and the control switches, such being connected to the first housing by an electrical cable connection. The second housing is separate from the first housing and is adapted to be placed close to the operators and remote from the first housing so as to be accessible to the operators so they can read the indicators and can operate the control switches.

3,592,049

METHOD AND APPARATUS FOR AUTOMATIC LEAK DETECTOR

James G. Johanski, Jr., Walnut Creek, Calif., assignor to Safeway Stores, Incorporated, Oakland, Calif.

Filed Sept. 20, 1968, Ser. No. 764,371
Int. Cl. G01m *3/26*
U.S. Cl. 73—45.2 **26 Claims**



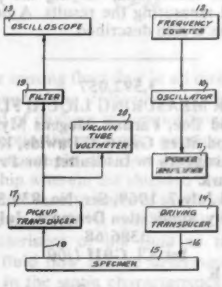
A method and apparatus for automatic leak detection for use with an automatic packaging machine in which food or other materials are sealed in leak-proof packages. The packages are placed into vacuum chambers which are evacuated and gas detectors detect any leakage from the sealed packages. Packages which contain leaks are directed into a reject bin so that they may be repackaged and properly sealed to prevent spoilage.

3,592,050

METHOD OF DETECTING INHOMOGENEITIES IN CERAMICS

Alfred W. Nutt, Jr., Los Alamos, N. Mex., and Joseph H. Handwerk, Joliet, Ill., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed June 30, 1969, Ser. No. 837,459
Int. Cl. G01n *24/00*
U.S. Cl. 73—67.2 **1 Claim**



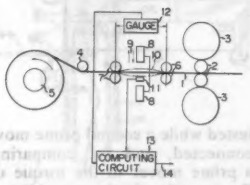
A method of detecting inhomogeneities in a ceramic solid solution by measuring the internal friction in the solid solution and comparing it with a standard. This was done by vibrating a sintered bar formed from the solid solution at mechanical resonance and comparing the rate of amplitude decay of the vibrations with a standard.

3,592,051

APPARATUS FOR METHOD FOR DETERMINING THE DEGREE OF ELONGATION OF METAL STRIPS

Moritada Kubo, Tokyo, and Kuniji Asano, Kawasaki-shi, both of, Japan, assignors to Tokyo Shibaura Electric Co. Ltd., Kawasaki-shi, Japan

Filed July 10, 1969, Ser. No. 840,810
Claims priority, application Japan, July 12, 1968, 48458/68
Int. Cl. G01n *24/00*
U.S. Cl. 73—67 **6 Claims**



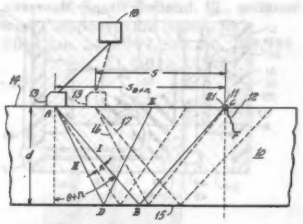
An apparatus to perform the method which comprises the steps of forcibly applying vibrations to a metal strip to generate standing wave vibrations at a prescribed wavelength, and measuring the amplitude of the standing wave vibration, thereby defining the degree of elongation of said strip from the values of the amplitude and the wavelength.

3,592,052

ULTRASONIC CRACK DEPTH MEASUREMENT

Giulio Di Giacomo; Solomon Goldspiel, and William J. Jones, all of Brooklyn, N.Y., assignors to The United States of America as represented by the Secretary of the Navy

Filed Jan. 8, 1969, Ser. No. 789,727
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.8 **3 Claims**



Ascertaining the depth of a crack in a welded specimen comprising generating a sonic wave inwardly on one face of the specimen, moving the source of said wave toward or away from said crack until a relatively strong reflection is detected, then moving said source away until the signal amplitude vanishes. The distance between the source and the weld is measured and the source then moved toward the weld until the signal amplitude again vanishes and the distance measured again. With these parameters and knowing the physical dimensions of the specimen the crack depth at the weld is mathematically determined.

3,592,053

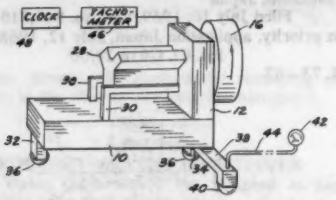
APPARATUS FOR DETERMINING THE TORQUE PERFORMANCE OF PRIME MOVERS

Carroll J. Lucia, Box 38, Suamico, Wis.

Continuation-in-part of application Ser. No. 667,574, Oct. 24, 1967, now Patent No. 3,505,863. This application Sept. 29, 1969, Ser. No. 861,982
Int. Cl. G01m *15/00*
U.S. Cl. 73—116 **4 Claims**

The torque performance of a prime mover is tested, according to the invention, by having its output shaft coupled

to a flywheel of known inertia which is driven and accelerated from a first predetermined angular velocity to a second predetermined angular velocity. The time taken for accelerating the flywheel is measured, and the average torque developed by the prime mover is derived from the time taken to accelerate the flywheel. The continuous torque developed, during acceleration, by the prime mover is monitored by measuring the reaction force exerted by the flywheel upon its support during acceleration. Alternately, the invention provides for a test stand on which a prime



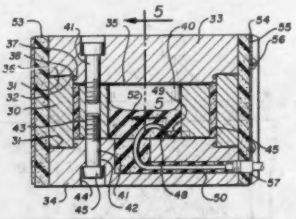
mover may be tested while a second prime mover is being installed or disconnected, and for comparing the torque developed by a prime mover to the torque of a reference prime mover. The invention further provides a simplified instrumentation system for determining the torque performance of an engine or other prime mover by counting the revolutions of the output shaft at various time intervals during acceleration by means of an impulse signal for each revolution of the shaft which is fed into an impulse counter whose output is connected to a recorder instrument.

3,592,054

STRUCTURAL LOAD CELL

Donald R. Stewart, and Howard B. Dutro, both of Denver, Colo., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Dec. 18, 1968, Ser. No. 784,849
Int. Cl. G01e 5/00
U.S. Cl. 73—141 **11 Claims**



A load cell, a cylindrical tube having disc-shaped caps closing the ends thereof, strain gages at the inner wall of the tube and a cylindrical connector block within the tube to which the caps are connected. The ends of the tubes are slightly bevelled to provide a linelike contact with the caps adjacent to the inner wall of the tube at small loads, but a full surface contact at design loads. The resulting strain pattern on the strain gages provided for more sensitive measurements at the smaller loads. The height of the connector block is selected to provide a small clearance between it and the end caps at normal design loads. However, when the cell is overloaded the end caps bottom against the connector block so that the connector block cooperates with the tube to resist the excess load.

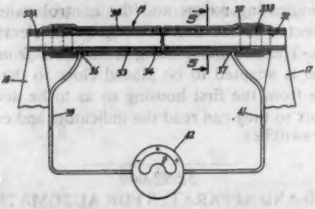
3,592,055

DIRECTIONAL SENSOR

Frank D. Dorman, St. Paul, Minn., assignor to Thermo-Systems, Inc., St. Paul, Minn.

Filed Feb. 12, 1969, Ser. No. 798,756
Int. Cl. G01w 1/02
U.S. Cl. 73—188 **12 Claims**

A fluid flow sensing instrument having a hot-wire or hot-film sensor mounted on the end of a probe for measuring the velocity of the flowing fluid. The sensor is combined with transducers, as thermocouple junctions, for sensing nonuniform distribution of heat on the sensor and generating an EMF which indicates the velocity vector of the flowing fluid.

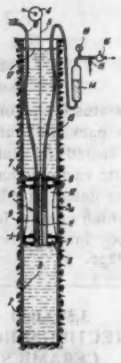


3,592,056

PROCESS FOR MEASURING THE PRESSURE AND/OR RATE OF FLOW OF INTERSTITIAL FLUID IN A PERMEABLE MEDIUM

Jean Bernaix, Saint-Mande, France, assignor to Coyne et Bellier, Bureau d'Ingenieurs Conseils, Paris, France

Filed Feb. 19, 1968, Ser. No. 706,436
Claims priority, application France, Feb. 20, 1967, 95 601
Int. Cl. G01p 5/00
U.S. Cl. 73—194 **12 Claims**



A process for measuring the pressure and/or rate of flow of interstitial fluid in a permeable medium, such as porous or fissured rock, comprising lining the wall of an elongated cavity in the medium with a flexible membrane, creating a pressure within the membrane exceeding the pressure of the interstitial fluid in order to apply the membrane against the wall of the cavity, isolating a short portion of the length of the interior of the membrane, varying the pressure in this short portion and measuring the results. A device for carrying out this process is also described.

3,592,057

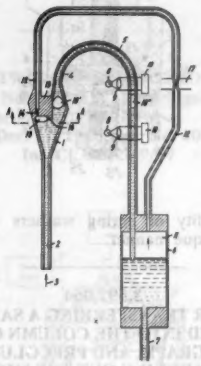
DEVICE FOR MEASURING LIQUID FLOW RATE

Christian Thorkild Boe, Farum; Mogens Myrup Andreasen, Copenhagen, and Steen Gamwell Dawids, Kalmpenborg, all of, Denmark, assignors to Instituttet for Produktudvikling, Lyngby, Denmark

Filed July 7, 1969, Ser. No. 839,587
Claims priority, application Denmark, July 10, 1968, 3386/68
Int. Cl. G01f 1/00
U.S. Cl. 73—194 R **7 Claims**

A device for measuring liquid flow rate in a duct by introducing a fluid bubble in the duct and measuring the interval between the bubble's passage of two spaced measuring points. To form and introduce the bubble there are provided two chambers in the duct so that the static pressure in the

downstream chamber exceeds that in the upstream chamber. The chambers are connected by means of a separate bubble



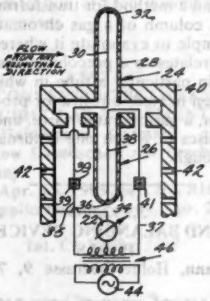
fluid duct opening into a downwardly facing recess in the upstream chamber whereby a fluid bubble is gradually formed and released to the liquid flowing through the chamber.

3,592,058

OMNIDIRECTIONAL FLUID VELOCITY MEASURING DEVICE

James M. Benson, and Edmond Easter, both of Hampton, Va., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed Sept. 17, 1968, Ser. No. 760,014
Int. Cl. G01p 5/10
U.S. Cl. 73—204 3 Claims



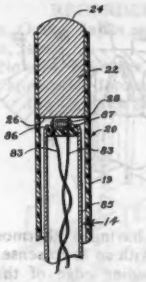
Apparatus for sensing fluid flow in all directions of azimuth in a predetermined plane irrespective of changes in ambient temperature and of changes in composition or static pressure of the fluid wherein the apparatus provides for at least one unshielded thermocouple and one shielded thermocouple in circuit relationship wherein the shielded thermocouple is sensitive to the static characteristics of the fluid and wherein the unshielded thermocouple is additionally sensitive to the dynamic characteristics of the fluid so that the accurate velocity of the fluid flow can be determined independently from variations in the static characteristics of the fluid, e.g. composition or static pressure. Apparatus is also disclosed which utilizes three exposed thermocouple junctions located in a line for accurately sensing fluid flow in all directions of azimuth in a predetermined plane independently of changes in ambient temperature.

3,592,059

TEMPERATURE MEASURING APPARATUS

George E. Chilton, Haworth, N.J., assignor to Computer Diode Corporation, Fairlawn, N.J.

Continuation-in-part of application Ser. No. 733,738, May 21, 1968. This application June 27, 1969, Ser. No. 843,276
Int. Cl. G01k 1/20, 7/24
U.S. Cl. 73—362 12 Claims



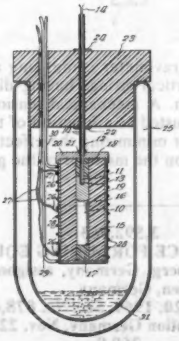
A disposable heat receptor is placed in heat-absorbing relationship with a body or atmosphere whose temperature is to be measured when the heat receptor reaches the temperature of the environment. The heat receptor is then transferred to an apparatus for measuring of its temperature Provision is made for a first surface of the heat absorber to be placed in heat exchange relationship with the environment and for a second and different surface to be placed in contact with the sensing element of the temperature-measuring apparatus so that contamination of temperature-measuring apparatus is avoided.

3,592,060

APPARATUS AND METHOD FOR MEASURING THE THERMAL CONDUCTIVITY OF INSULATING MATERIAL

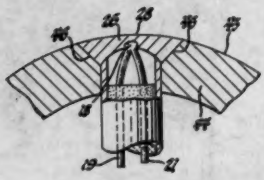
Royce Jay Laverman, South Holland, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jan. 24, 1969, Ser. No. 793,789
Int. Cl. G01n 25/20
U.S. Cl. 73—15 9 Claims



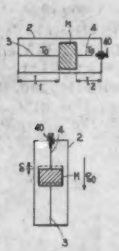
Apparatus for quickly determining the thermal conductivity of a material over a wide temperature range in a single test. The apparatus comprises a heat sink of metal of known heat capacity, a shell surrounding and spaced away from the metal heat sink providing a space in the shell for placing a sample material, the thermal conductivity of which is to be determined, essentially all around the metal heat sink, means for measuring the temperature of the metal heat sink, and means for measuring the temperature of the shell to thereby determine the temperature difference through the sample.

3,592,061
GAS TURBINE AIRFOIL HAVING INTEGRAL THERMOCOUPLE
Ronald P. Schwedland, Indianapolis, and Morris F. Hall, Danville, both of, Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed Aug. 22, 1969, Ser. No. 852,434
Int. Cl. G01k 1/14, 7/04
U.S. Cl. 73—343 R 6 Claims



A gas turbine airfoil having a thermocouple assembly mounted integrally therewith so as to sense the temperature at the surface of the leading edge of the airfoil without disturbing the gas flow conditions within the engine is disclosed.

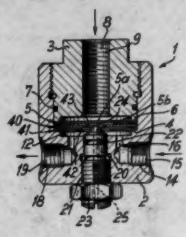
3,592,062
VIBRATING STRINGS GRAVIMETER
Raymond Mathey, Paris, France, assignor to Thomson CSF
Filed Oct. 31, 1969, Ser. No. 872,982
Claims priority, application France, Nov. 22, 1968, 174,999
Int. Cl. G01v 7/16
U.S. Cl. 73—382 3 Claims



A vibrating strings gravimeter comprising a mass secured to a frame by two vertical strings having different characteristics, such as length. A mechanical tension is applied to these strings and is adjusted as a function of the mass and of these characteristics for minimizing the effect of parasitic alternating acceleration on the measure of the gravitational acceleration.

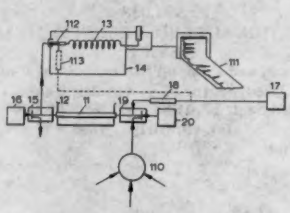
3,592,063
CONTROL DEVICE FOR MINING EQUIPMENT
Hans Rieschel, Miltenberg, Germany, assignor to Bergwerksverband GmbH, Essen, Germany
Filed Nov. 20, 1969, Ser. No. 878,408
Claims priority, application Germany, Nov. 22, 1968, P 18 10 260.8
Int. Cl. G01l 7/08
U.S. Cl. 73—406 5 Claims

The invention relates to a device which can be used in the remote control technique in mining and in particular hydraulic mining and serving for the conversion of a hydraulic pressure into a pneumatic analog pressure signal. The device has a diaphragm which is subjected on one side to hydraulic pressure and on its other side to constant pneumatic pressure. The diaphragm is arranged in a pressure chamber which has an output for the analog signal and a connection for the constant supply of pneumatic line pressure. An axially adjustable tube has an end facing the diaphragm and provides an annular slot with the diaphragm. The tube has bore open to the



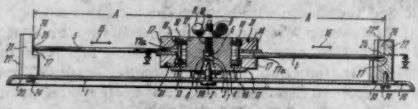
outside. A plurality of spring washers resist diaphragm deflection in a unique manner.

3,592,064
METHOD FOR TRANSFERRING A SAMPLE TO BE ANALYZED INTO THE COLUMN OF A GAS CHROMATOGRAPH, AND PRECOLUMN SYSTEM FOR CARRYING OUT THE METHOD
Jorgen Johan Gether, Oslo, Norway, assignor to Bryggerilindustriens forskningslaboratorium and Sentralinstitutt for industriell forskning, Forskningsveien, Oslo, Norway
Filed Feb. 18, 1969, Ser. No. 800,226
Int. Cl. G01n 1/28
U.S. Cl. 73—422 3 Claims



An apparatus and a method for transferring a sample to be analyzed into the column of a gas chromatograph by rapid heating of the sample to evaporate it whereby transfer is effected. It further relates to a precolumn system for carrying out the method, in particular a tube in which the sample is frozen out and then heated, a restrictor providing a pressure drop in the system, a gas-operated valve, and a selection unit comprising two discs of which one is turnable, both having channels therethrough.

3,592,065
ASSEMBLING AND BALANCING DEVICE FOR A SET OF TOOLS
Ludwig Seydelmann, Holderlinstrasse 9, 7 Stuttgart, Germany
Filed July 26, 1968, Ser. No. 748,096
Claims priority, application Germany, July 31, 1967 P 16 48 695.6
Int. Cl. G01m 1/12
U.S. Cl. 73—483 10 Claims



A pair of symmetrically opposite blades for a meat cutter are temporarily assembled on a hub which is universally swivelable on a baseplate having abutments for locating the free ends of the blades; the hub passes through elongated cutouts in the blade shanks which are thus radially adjustable to

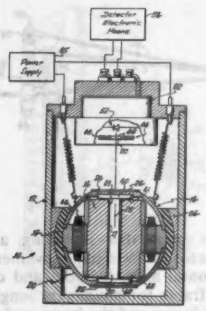
their proper length as determined by these abutments. Upon such adjustment, two relatively rotatable and eccentrically weighted clamping rings are turned until the assembly is balanced on the hub axis, the rings being then immobilized with reference to the blades whereupon the entire assembly is removed from the hub for mounting on the drive shaft of the meat cutter.

3,592,066

TWO-AXIS RATE GYRO

Gerald B. Speen, Northridge, Calif., assignor to Conductron Corporation, Northridge, Calif.

Filed Dec. 12, 1966, Ser. No. 601,016
Int. Cl. G01c *19/04*
U.S. Cl. 74—5.5 6 Claims



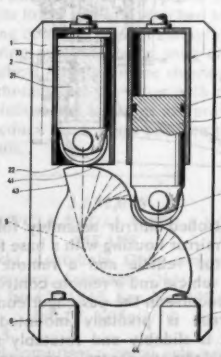
This invention relates to a control device and more particularly to a two-axis rate gyro in which the rotatable mass of the gyro is contained within a casing having a peripheral partially spherical exterior wall with opposed flat ends perpendicular to the spin axis of the rotating mass. The casing is in turn mounted within the exterior frame, or housing member, by means of elastomeric material which supports the casing and connects the casing to the frame. The configuration of the elastomeric mass is such that it supports the casing without the need of additional gimbles or bearings, and allows movement of the casing about two axes. Means are provided for the detection of such movement about the two axes for control purposes.

3,592,067

DEVICE FOR CONVERTING BETWEEN LINEAR AND CIRCULAR MOVEMENT

Walter Hetzer, Haidholzen, Germany, assignor to Messerschmitt-Bolkow Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed Apr. 15, 1969, Ser. No. 816,315
Claims priority, application Germany, Apr. 20, 1968, P 17 50 322.9
Int. Cl. F16h *25/08*
U.S. Cl. 74—55 6 Claims



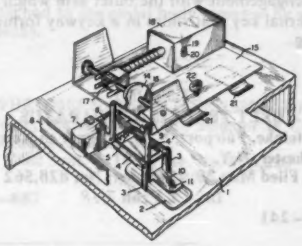
A device for converting between linear and circular movement, is composed of a rodlike member, capable of linear movement, in contact with a cam surface formed on a shaft, capable of circular movement. The cam surface is formed as an evolute curve based on a base circle determined by the circumference of the shaft. The rodlike member has punctiform contact with the cam surface, and each contact point is on a tangent to the base circle aligned rectilinearly with the axis of reciprocation of the rodlike member.

3,592,068

DEVICE FOR ADJUSTING THE HEAD IN TAPE RECORDER

Takehiko Yamada, Osaka, Japan, assignor to Orion Electric Co., Ltd., Osaka, Japan

Filed Nov. 14, 1969, Ser. No. 876,917
Claims priority, application Japan, Feb. 3, 1969, 44/10007
Int. Cl. F16h *21/02*
U.S. Cl. 74—89 3 Claims



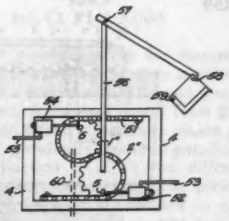
A tape recorder head adjuster includes a mounting plate fixed to a frame. The mounting plate has a parallelogram link member supported by a pin on the mounting plate. The free end of the member has a head mounting plate having at one end the head. At the other end of the head mounting plate is contacted by a cam mounted on a rotatable shaft. A spring operates to bias the member and the head normally up. When the cam is rotated, the head is forced down against the force of the spring.

3,592,069

ROLLER-RIBBON MECHANICAL MOTION APPARATUS

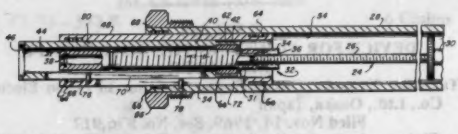
Thomas Ross Welch, P.O. Box 5339, Santa Monica, Calif.

Filed Apr. 3, 1968, Ser. No. 718,453
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.2 28 Claims



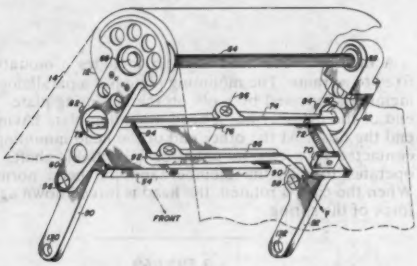
A lever mechanism having a shiftable, frictionless fulcrum utilizing a roller-ribbon construction.

3,592,070
LINEAR ACTUATOR
Ivan K. Hammond, Box 182, Boonton, N.J.
Filed July 14, 1969, Ser. No. 841,534
Int. Cl. F16h 27/02, 1/18
U.S. Cl. 74—89.15 3 Claims



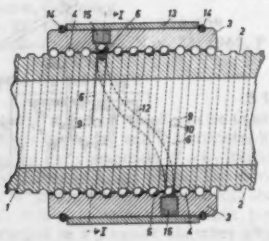
A linear actuator for telescopic movement is provided in which rotation of an inner shaft transmits linear movement to at least one outer hollow arm. The inner shaft is placed in threadable engagement with the outer arm which is provided with an external key that slides in a keyway formed in a support housing.

3,592,071
BELT TRACKING APPARATUS
James M. Steinke, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed May 28, 1969, Ser. No. 828,562
Int. Cl. F16h 7/18
U.S. Cl. 74—241 10 Claims



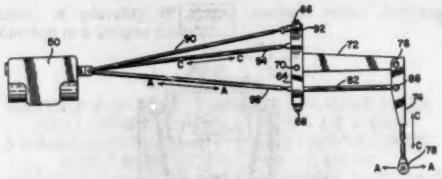
Belt tracking apparatus for use with a nonstretchable continuous belt in conjunction with a plurality of belt supporting drums or rollers. The shaft of the belt tracking drum is mounted for short pivotal movement about an axis normal to its axis, said normal axis lying in a plane that bisects the angle of the belt runs on either side of the tracking drum. With the use of belt sensing means, a mechanical feedback linkage is utilized to pivot the tracking drum about said bisecting axis in order to effect accurate belt tracking.

3,592,072
BALL NUT MECHANISM
Sven Walter Nilsson, Savedalen, Sweden, assignor to Aktiebolage; Svenska Kullagesfabriken, Goteborg, Sweden
Filed May 12, 1969, Ser. No. 823,559
Claims priority, application Sweden, May 13, 1968, 6406/68
Int. Cl. F16h 55/22
U.S. Cl. 74—459 2 Claims



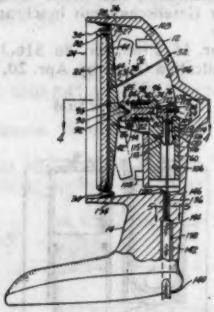
To ensure a smooth transfer of the balls in a ball nut mechanism, the nut is provided with an elongated, solid catching member, which is designed to extend into the ball race and has an obliquely cut edge, which forms the base of a tangential passage for guiding the balls away from the race towards a return passage within the nut.

3,592,073
CONTROL SYSTEM FOR TREE SHAKER APPARATUS
Stuart D. Pool, Naperville; Edward Svereika, Chicago, Ill., and Jack B. Findlay, Minneapolis, Minn., assignors to International Harvester Company, Chicago, Ill.
Division of Ser. No. 753,378, Aug. 19, 1968, Pat. No. 3,537,246. Filed Feb. 5, 1970, Ser. No. 13,223
Int. Cl. G05g 9/04
U.S. Cl. 74—471 R 5 Claims



A tree shaker apparatus including a frame pivotally mounted on a tractor for swinging movement about a vertical axis and a horizontal axis. A boom and clamp assembly is mounted on the frame for movement longitudinally thereof. Movement of the frame and the boom and clamp assembly is provided by hydraulic cylinders controlled through respective valves. The valves are actuated by selective operation of a control lever which is mounted for swinging movement in three modes which are manifested in similar movements of the frame and the boom and clamp assembly to position the clamp in gripping relation on a tree limb to be shaken by the apparatus.

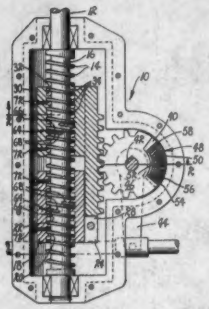
3,592,074
REMOTE-CONTROLLED MIRROR
Carl M. Petersen, III, Pontiac, and William C. Wehner, Detroit, both of, Mich., assignors to International Engineering Service, Inc., Birmingham, Mich.
Filed Aug. 11, 1969, Ser. No. 848,957
Int. Cl. G05g 1/08
U.S. Cl. 74—491 10 Claims



A remote-controlled mirror assembly for an automotive vehicle having a mirror housing with a base for attachment to the outside of the vehicle and a remote control for attachment to the vehicle and a remote control for attachment to the vehicle structure in the passenger compartment of the vehicle. A mirror is pivotally mounted on a control mechanism that is slidably and rotatably mounted on the housing, with the remote control connected to the control mechanism by a single connecting cable. Sliding motion of the control mechanism by means of the remote control and

cable pivots the mirror about a first axis contained in the plane of the mirror, while rotary motion of the control mechanism by means of the remote control and cable pivots the mirror about a second axis contained in the plane of the mirror and substantially perpendicular to the first axis.

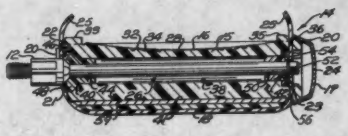
3,592,075
STEERING MECHANISM
Marion A. Clark, 546 W. Pleasant, Tulare, Calif.
Continuation-in-part of application Ser. No. 817,030, Apr. 17, 1969, now abandoned. This application Oct. 22, 1969, Ser. No. 871,514
Int. Cl. B62d 1/20
U.S. Cl. 74—498 **6 Claims**



This disclosure concerns an improved steering mechanism which eliminates the reverse direction lag which causes play in the steering wheel. The steering wheel is connected to a shaft which has a helical thread at its lower end disposed in the bores of two bearing nuts which are separately movable on the shaft and contain reciprocal threads. In a first embodiment, one of the bearing nuts is formed integral with a single-track rack gear and the other with a double track rack gear with a slot between its tracks which slidably receives the single-track gear. The single-track rack gear is engaged with a single-pinion gear, and the double track rack gear with a pair of pinion gears mounted in axial alignment with and on each side of the single pinion. The pinion gears are mounted on a power shaft which drives the steering rod, and the two paired gears are keyed to the power shaft while the single gear is freely mounted on the power shaft but is connected to the paired pinions by a spring coupling which urges the paired pinion gears in an opposite rotational direction with respect to the single pinion, and in turn, through the rack gears, urges the bearing nuts in opposite linear directions on the helical threads on the steering shaft. In the second embodiment the rack gears and pinion gears are eliminated and a helical spring coupling surrounds the steering shaft between the bearing nuts urging the bearing nuts in opposite linear directions on the helical threads. Also, the power shaft is replaced by a thrust rod which is disposed coaxially with the steering shaft at its lower end and attached to the lower bearing nut. The spring coupling in each embodiment assures that both of the bearing nuts will be in snug engagement at all times with the helical threads on the steering shaft, one with one side of the threads and the other with the opposite side of the threads. Helical ball bearings are provided in each of the ball nuts to reduce the friction between the engaging surfaces of the threads.

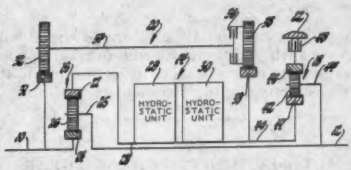
3,592,076
PLASTIC BICYCLE PEDAL WITH A FOOT STRAP MEANS
Martin R. Baginski, Ashtabula, Ohio, assignor to Ashtabula Bow Socket Company, Ashtabula, Ohio
Filed June 3, 1969, Ser. No. 829,993
Int. Cl. G05g 1/14
U.S. Cl. 74—594.5 **13 Claims**

A bicycle pedal comprises a pedal axle and a pedal body. The pedal body includes a pedal body member, protective strap means for the body member, bearing means, and foot strap means. The pedal body has an upper side adapted to engage the cyclist's foot and outer sides adjacent to the upper side. The protective strap means defines at least a portion of the outer sides for protecting the pedal body member



which is formed from a plasticlike material. The pedal body member receives the bearing means which in turn receives the pedal axle such that relative rotation between the pedal axle and the pedal body may be effected. The foot strap means is attached to the pedal body member by said protective strap means.

3,592,077
HYDROMECHANICAL TRANSMISSION
James C. Polak, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Sept. 4, 1969, Ser. No. 855,223
Int. Cl. F16h 47/04
U.S. Cl. 74—687 **7 Claims**

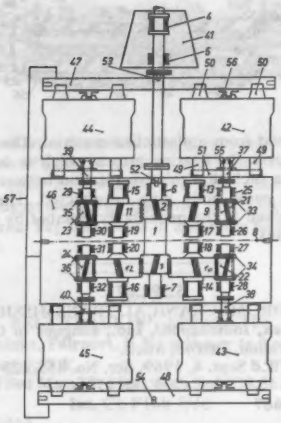


A hydromechanical transmission comprising planetary gearing dividing input power between the transmission output and a variable speed ratio hydrostatic drive train having a pair of operatively hydraulically connected variable displacement hydrostatic units to provide a low speed range drive between the transmission input and output and the same planetary gearing combining power from the transmission input and the hydrostatic drive train to provide a high speed range drive between the transmission input and output with the speed ratio in both speed range drives varied by varying the hydrostatic drive train speed ratio with shifting between drives provided by devices which are speed synchronized for engagement at a predetermined transmission input-output speed ratio.

3,592,078
MULTIPLE-PINION GEAR
Richard Stark, Mannheim, Germany, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland
Filed June 10, 1969, Ser. No. 831,922
Claims priority, application Germany, June 21, 1968, P 17 50 958.9
Int. Cl. F16h 37/06
U.S. Cl. 74—665 **13 Claims**

A multiple drive pinion gearing for transmitting power from the drive shaft of a driving machine to different working machines comprises a pair of axially spaced sets of gear teeth on the drive shaft which transmit power from the drive shaft via intermediate gear wheels to separate pinion gears respectively which are independently mounted parallel to the drive shaft and which function to drive the different working machines such as a turbocompressor. The pinion gears and their intermediate gear wheels are located on opposite sides of a divider plane extending between the two sets of gear teeth on the drive shaft and perpendicular to the axis of the drive shaft. All of the gears have helical toothing and the inclination of the teeth of those gears located on one side of

the divider plane is opposite to that of the teeth on those gears located at the opposite side of the divider plane. Moreover, thrust bearings are provided for the shafts of the intermediate gear wheels to restrain them against any axial



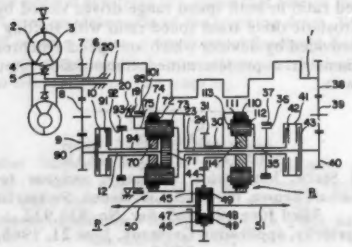
displacement, and the pinion gears are provided with abutment rings on each end thereof which overlap opposite ends of the intermediate gear wheels so as to transmit to the latter any axial thrust acting on the pinion gears.

3,592,079

AUTOMATIC SPEED CHANGE GEAR

Yoichi Mori, Yokohama, Japan, assignor to Nissan Jidosha Kabushiki Kaisha

Division of Ser. No. 682,811, Nov. 14, 1967, Pat. No. 3,482,469.
Filed Oct. 27, 1969, Ser. No. 871,194
Int. Cl. F16h *47/08*
U.S. Cl. 74—688 8 Claims



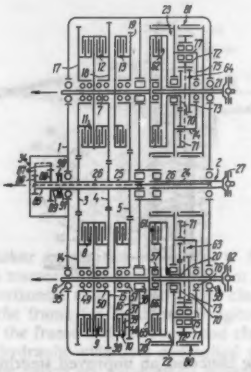
An automatic speed change gear in 6 to 8 forward stages and one rearward stage of speed reduction ratio, which comprises a hydraulic torque converter and a first and a second planetary gear assemblies. The first planetary gear assembly transmits the power from said torque converter to the second planetary gear assembly in at least three forward stages and a rearward stage. The second planetary gear assembly delivers output power in at least three forward slow speed stage and a rearward stage when it is not coupled with the torque converter, while in at least three forward high speed stages when it is coupled with the torque converter.

3,592,080

TRANSMISSION GEARBOX, PREFERABLY FOR USE IN A TRACTOR

Jury Petrovich Samatov, Prospekt Lenian, 22, kv. 30; Mikhail Davidovich Goldin, ulitsa Tankistov, k44a, kv. 31; Evgeny Ivanovich Tarakanov, ulitsa Bazhova, 36a, kv. 27; Vladimir Vasilievich Emelyanenko, ulitsa Turistov, 106, kv. 39; Ivan Savvateevich Kaviarov, prospekt Lenina, 15, kv. 20, and Vladimir Sergeevich Malchikov, 2 Sadovaya ulitsa, 19, kv. 23., all of Chelyabinsk, U.S.S.R.

Filed June 20, 1969, Ser. No. 834,967
Int. Cl. F16h *37/00;* B60k *17/28*
U.S. Cl. 74—740 8 Claims



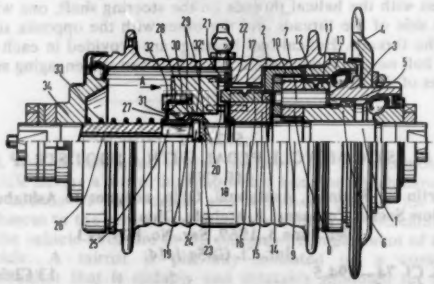
A transmission gearbox, for use with a tractor or the like comprising a housing, an input shaft located within the housing and being provided with a driving member and a driven member, a coupling element connecting the driving and driven members, layshafts located within the housing, continually mesh in gears operatively communicating with the input shaft and layshafts for transmitting torque from the input shafts and layshafts, friction clutches causing the continually mesh gears to communicate with the layshafts, output shafts are lined with the layshafts, and reversing coupling gears into locking when a forward speed is provided by the gearbox and for connecting the output shaft to the layshaft when a reverse speed is provided.

3,592,081

MULTIPLE SPEED HUB WITH AUTOMATIC GEAR CHANGE AND MANUAL OVERRIDE

Hans Joachim Schwerdhofer, Schweinfurt am Main, Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed Mar. 5, 1970, Ser. No. 16,920
Claims priority, application Germany, Mar. 7, 1969
P 19 11 548.1
Int. Cl. F16h *5/46;* F16d *41/00, 45/00*
U.S. Cl. 74—752 E 12 Claims



A dual-speed bicycle hub with planetary gearing and automatic gear shift operated by a centrifugal governor is addi-

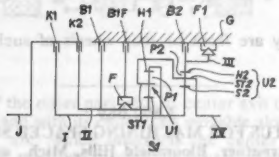
tionally equipped with a manual override permitting manual speed selection while movement of the flyweight in the govérnor under the influence of centrifugal forces is blocked. The manual controls may shift the otherwise blocked flyweight and thereby act on an overrunning clutch in the transmission or act on a separate clutch while the flyweight is immobilized.

3,592,082

PLANETARY GEAR TRANSMISSION WITH INTERCONNECTED PLANET CARRIERS

Anton Ott, Olgastrasse 6, Friedrichshafen, Germany

Filed Sept. 4, 1969, Ser. No. 855,315
Claims priority, application Germany, Sept. 6, 1968, Sept. 6, 1968, Z 12 079;Z 12 078
Int. Cl. F16h *57/10*
U.S. Cl. 74—761 **8 Claims**



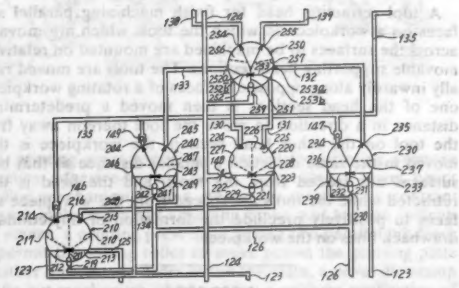
An automotive transmission with two cascaded planetary gear trains has the two planet carriers rigidly connected with each other and with the output shaft, the input shaft being alternatively connectable with one sun and one ring gear (forward) and other sun gear (reverse) or with one ring gear only (forward) and the two rigidly interconnected sun gears (reverse); in the latter case, one of the gear trains has two sets of intermeshing planet gears to invert the sense of relative rotation of the interconnected sun gears and planet carriers during operation in reverse gear.

3,592,083

AUTOMATIC TRANSMISSION CONTROL SYSTEM

Minoru Kawabata, Chita-gun, Aichi-ken, Japan, assignor to Toyoda Koki Kabushiki Kaisha

Filed July 7, 1969, Ser. No. 839,542
Claims priority, application Japan, July 13, 1968, 43/49476
Int. Cl. B60k *21/06;* **F15c** *1/08;* **F04b** *49/08*
U.S. Cl. 74—868 **14 Claims**



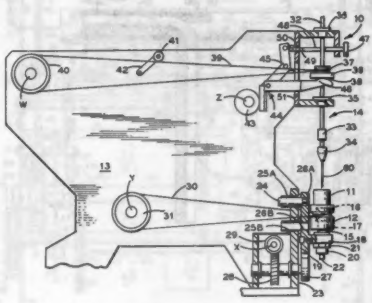
An automatic transmission control system which comprises a pressure fluid supply source for supplying pressure fluid, a shift valve for selectively actuating friction engaging means to complete diverse driving connections between a drive shaft and a driven shaft, and a group of pure fluid control elements which have no movable parts and may control the pressure fluid in response to vehicle speed and throttle opening to selectively actuate the shift valve.

3,592,084

DIE-WORKING MACHINE

Karl B. Gelfand, Mexico City, Mexico, and Max Rovinksy, North Bellmore, N.Y., assignors to National Wire Die Co., Inc., New York, N.Y.

Filed Oct. 31, 1968, Ser. No. 772,310
Int. Cl. B21k *5/20*
U.S. Cl. 76—4 **8 Claims**



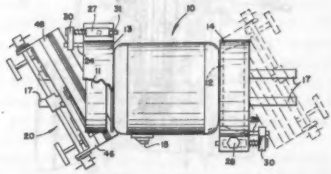
A die-working machine featuring a plurality of die-working stations grouped together in side-by-side relation and operating from a common drive means. Each die-working station is equipped with a dieholder and a toolholder, the movements of which can be adjusted independently of the other stations. The dieholder is rotatably driven about one axis and is supported for driven angular oscillatory movement about either of two selectable pivot axes transverse to its rotation axis. The toolholder is adapted to hold either a needle or a wire tool that works a die secured to the dieholder, which toolholder is driven rotatably about an axis intersecting the dieholder pivot axes and is also reciprocable along its axis of rotation.

3,592,085

SAW CHAIN GRINDING DEVICE

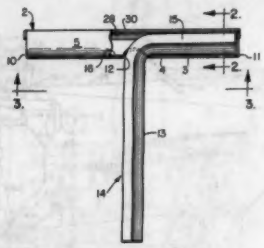
Floyd D. Arneson, 2028 "L" St., Springfield, Oreg.

Filed Oct. 31, 1968, Ser. No. 772,129
Int. Cl. B23d *63/00*
U.S. Cl. 76—25 **5 Claims**



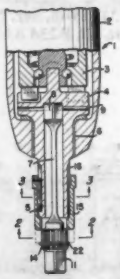
The present disclosure includes a stationary electrical motor with abrasive grinding means affixed to its motor shaft. A saw-chain-holding mechanism is positionably mounted adjacent the grinding means for advancing a chain saw cutter tooth held thereon into sharpening contact with said grinding means. The holding mechanism includes chain-engaging elements to locate and secure each during grinding. The abrasive means includes a shaped grinding wheel for rotation in a single plane and having a beveled surface against which a cutter tooth may be horizontally swung while retained on said mechanism. A screw feed is provided for additionally locating a cutter tooth during grinding. At the completion of grinding the cutter tooth is swung away from the grinding means whereupon another cutter tooth of the same series may be advanced into place on the chain-holding mechanism.

3,592,086
TOOL HANDLE STRUCTURE
Louis A. Derwin, 4508 Cross St., Downers Grove, Ill.
Filed Jan. 27, 1969, Ser. No. 793,972
Int. Cl. B25b *13/00*; B25g *1/00*
U.S. Cl. 81—177 A 10 Claims



A tool handle for an L-shaped Allan Wrench or the like comprising a tubular structure for receiving one leg of the wrench and having an opening intermediate its ends for passing the other leg of the wrench therethrough. Several embodiments comprise a tubular structure which has upper and lower interlocked portions which are separable lengthwise to permit insertion and withdrawal of the tool and which snugly embrace and pocket one leg of the tool.

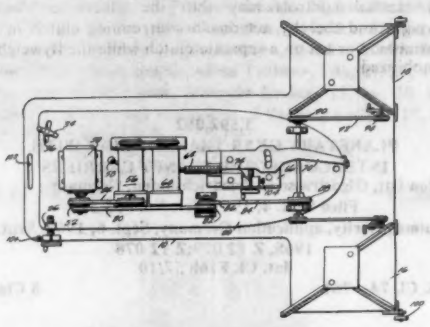
3,592,087
IMPACT WRENCH DRIVE
Reginald W. Pauley, Belle Mead, N.J., assignor to Ingersoll-Rand Company, New York, N.Y.
Filed Aug. 27, 1969, Ser. No. 853,333
Int. Cl. B25b *19/00*
U.S. Cl. 81—52.3 11 Claims



An impact wrench having a torsion bar and a latch means which can be manually moved between an inoperative position, wherein the torsion bar limits the torque delivered by the wrench to a fastener, and an operative position, wherein the wrench anvil is connected substantially rigidly to the fastener to deliver an increased torque to the fastener.

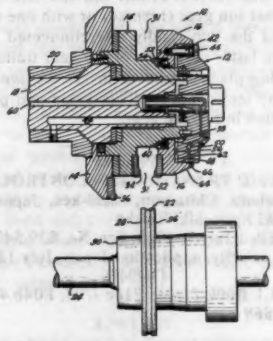
3,592,088
BRAKE DISC CUTTER
Donald E. Welling, 42 Anthony Wayne Terrace, Baden, Pa.
Filed June 12, 1969, Ser. No. 832,774
Int. Cl. B23b *5/04*
U.S. Cl. 82—4 A 3 Claims

A brake disc cutter used to true up distorted or scored brake discs for automotive, truck and aircraft disc brakes, and in which the method is accomplished on the brakes while they are yet on the vehicle, or on other mounting gear, and



whether they are front or rear wheels of such automotive vehicle.

3,592,089
APPARATUS FOR MACHINING SPACED SURFACES
Frank C. Skrentner, Bloomfield Hills, Mich., assignor to La Salle Machine Tool Inc., Warren, Mich.
Filed June 16, 1969, Ser. No. 833,349
Int. Cl. B23b *21/00*
U.S. Cl. 82—25 5 Claims



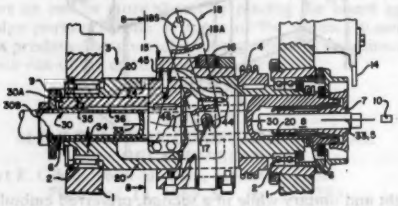
A tool retracting head for finish machining parallel surfaces on a workpiece in which the tools which are movable across the surfaces to be machined are mounted on relatively movable supporting head sections. The tools are moved radially inwardly along opposite surfaces of a rotating workpiece, one of the head sections is then moved a predetermined distance in a direction to move the tool thereon away from the tool on the other head section, the workpiece is then moved in the same direction a smaller distance so that both surfaces are spaced from the tools, and the head is then retracted while the tools are spaced from the workpiece surfaces to positively preclude the formation of objectionable drawback lines on the workpiece.

3,592,090
ROTARY ASSEMBLY OF THE HOLLOW SPINDLE TYPE
Raymond G. Koopman, Floyds Knobs, Ind., assignor to M.K.M. Machine Tool Co., Inc., Jeffersonville, Ind.
Filed June 25, 1969, Ser. No. 836,325
Int. Cl. B23b *19/02*
U.S. Cl. 82—30 8 Claims

A rotary spindle assembly is composed of a pair of hollow cylindrical outer and inner parts, each having a pair of equally spaced long parallel axes, one a center axis and the other an offset bore axis. The inner part additionally has a

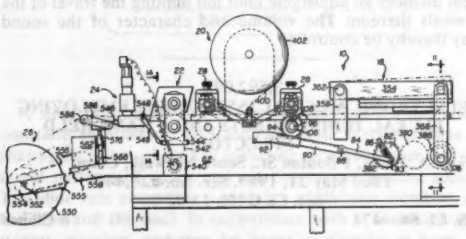
chuck for centering a stock-rod on the center of its offset bore, which is large enough to embrace all four axes. The bore and chuck axes of the inner part, and the center axis of a chuck-held stock-rod, all coincide.

The outer cylindrical part is mounted in an automatic screw machine with its center axis coincident to the main rotary axis of the machine and with its bore axis offset therefrom. The inner cylindrical part is mounted within the



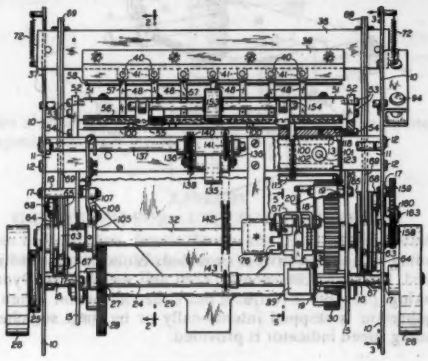
offset bore of the outer part with its center axis coincident to the bore axis and with its chuck axis movable along a circular "adjustment" arc, which intersects the center axis of the outer part. By angularly turning the inner cylindrical part, a chuck-held stock-rod may be swung along said circular adjustment arc either to bring the center axis of the rod into coincidence with the center axis of the outer part or to bring any offset rod axis along that adjustment arc into such coincidence.

3,592,091
DIECUTTER
Gerald J. Ottavan, Ridgefield, N.J., assignor to Allamatic Corporation, Cliffside Park, N.J.
Division of Ser. No. 736,768, June 13, 1968. This application June 15, 1970, Ser. No. 46,417
Int. Cl. B26d *3/08*
U.S. Cl. 83—6 **2 Claims**



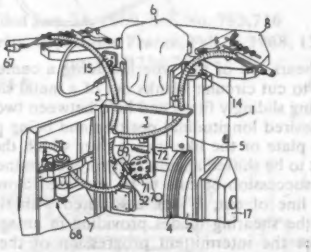
A printing press especially adapted for printing pressure sensitive adhesive-backed labels, comprising a novel paper feeding mechanism having means for maintaining constant tension including a self-adjusting brake and tension indicating means, a printing press head having two parallel ink feeds to permit the inking roller to move across the printing plate in either direction in order to ink the plate, a novel die-stamp or die-cut mechanism which assures a uniform application of cutting force over the entire peripheral edge of the label by virtue of a slightly resilient platen and a twin link arrangement for moving the movable die up and down, out of and into cutting relation with the label paper, a novel stripper having a slip clutch for driving a drum that pulls the unwanted material from the printed label at a substantially constant tension, a cutter of unique design not employing sheering for cutting the labels into longitudinal strips of a preselected integral number of labels and a takeup mechanism for rolling up the printed labels in lieu of cutting.

3,592,092
PAPER PUNCH
Frank C. Blowsky, 46-16 195th St., Flushing, N.Y.
Filed Sept. 29, 1969, Ser. No. 861,725
Int. Cl. B26d *7/16*
U.S. Cl. 83—156 **10 Claims**



A paper punch with adjustable and depressable paper stop means is described having a novel construction of means operating for the cutting punches by cams. In addition a single cam depresses the paper stop out of the way and also brings a feed roll into contact with the punches sheets for ejecting the same under the cutting punches. The paper stop is adjustable with respect to the cutting punches whereby the location of the punched holes with respect to the edge of the sheets may be adjusted without affecting the means for depressing the paper stop means or the timing thereof.

3,592,093
MACHINES FOR CUTTING SHEET MATERIAL, SHEET METAL AND THE LIKE
Alves Cantelli, via Don Minzoni 5, Rastignano (Bologna), Italy
Filed July 24, 1969, Ser. No. 844,294
Claims priority, application Italy, Aug. 10, 1968, 1742A
Int. Cl. B26d *7/16*
U.S. Cl. 83—364 **6 Claims**

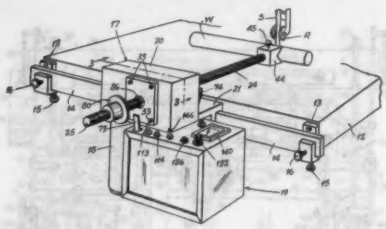


Automatic guides for positioning and aligning sheet material to be cut in which the guides carry elements to control a drive, which can be set to advance and retract and partially rotate the guides to required positions.

3,592,094
BANDSAW WORK FEED
Louis W. Greenblatt, 12 Ladue Manor, St. Louis, Mo.
Filed Aug. 28, 1969, Ser. No. 853,801
Int. Cl. B26d *1/46*
U.S. Cl. 83—201 **11 Claims**

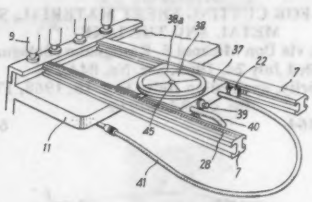
A variable-speed, constant-thrust, work feed for band and circular saws. It employs a DC motor generator in which motor speed and generator output voltage normally decrease as load increases, but it uses a control which increases motor

voltage input as a function of generator voltage reduction to maintain substantially constant speed and power. The feeding speed may be adjusted and may be automatically regulated to limit the load on the saw blade to prevent injury to the blade, and to give warning to the operator. Means to increase the



feeding rate temporarily is provided. Withdrawal is at higher speed. Limit switches control feed and withdrawal. Dynamic braking prevents overtravel in either direction when the mechanism is stopped intentionally or by limit switches. A feeding speed indicator is provided.

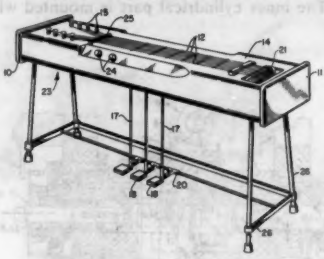
3,592,095
SHEARS AND THE LIKE APPARATUS FOR CUTTING SHEET MATERIAL
Rene Passa, Livry-Gargan, and Achille Romoli, St-Remy Saint-Denis, both of, France, assignors to Ste. B.R.G., rue Pasteur-Devil, La Barre, France
Filed Apr. 9, 1969, Ser. No. 814,593
Claims priority, application France, Apr. 17, 1968 148,326
Int. Cl. B26d *5/20*
U.S. Cl. 83—267 **9 Claims**



The shears are of the type including a centering carriage adapted to cut circular blanks out of a metal sheet, said carriage being slidingly fitted and held between two guiding rails in any desired longitudinal position and being provided with a rotary plate or the like means over which the metal sheet may rest to be shifted angularly by predetermined amounts to allow a succession of cuts to be executed along the desired circular line of cut, a jack associated with the jacks controlling the shearing blades providing in antagonism with a spring for the intermittent progression of the rotary plate through the agency of a ratchet wheel.

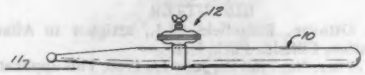
3,592,096
PITCH-VARYING APPARATUS FOR STRING INSTRUMENTS
Bryan D. Ritter, 23 Oakwood Drive, Monroe, La.
Filed Aug. 4, 1969, Ser. No. 847,184
Int. Cl. G10d *3/14*
U.S. Cl. 84—312 **11 Claims**

A tension-varying system and a mechanical linkage system therefor for varying the normal tones of guitar strings while the instrument is being played. The tension-varying system include for each guitar string two parallel, juxtaposed wires stretched between the end walls of and within the guitar body. One of the wires is connected at one end to the guitar body and at the other to a lever arm which by means of a spring is connected to the opposing wall of the guitar body. The other wire is likewise connected to one end to the same lever arm and at its other end to a second lever arm to which the guitar string is attached. When the former wire is depressed or further stretched it lowers the tone of the string while depressing or stretching the other wire raises the tone. In one embodiment (FIGS. 2—5) the second lever arm is



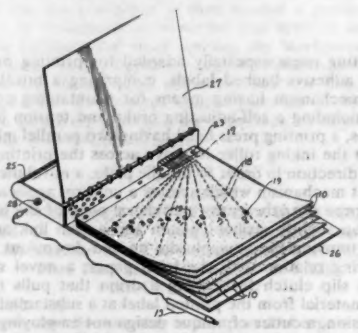
straight and unitary while in a second, preferred embodiment (FIGS. 6—8) the lever arm is pivoted and two piece and can break inwardly or outwardly. The mechanical linkage system (FIG. 9) for actuating the tension-varying system by depressing one or the other of the wires, includes uniform elements which have flexibility and adjustability.

3,592,097
PERCUSSION MUSICAL INSTRUMENT
Donald C. Friede, 4839 Dorsie Drive, Sappington, Mo.
Filed Feb. 9, 1970, Ser. No. 9,579
Int. Cl. G10d *13/06*
U.S. Cl. 84—402 **8 Claims**



This musical instrument includes a drumstick having a percussion assembly mounted thereon. The percussion assembly consists of a pair of cymbals freely mounted on a stem which is transversely oriented relative to the drumstick. The percussion assembly is adjustably clamped to the drumstick and the stem includes an adjustable limit nut limiting the travel of the cymbals thereon. The volume and character of the sound may thereby be controlled.

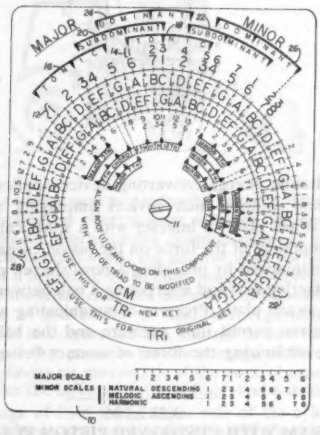
3,592,098
ELECTRONIC MUSICAL INSTRUMENT EMPLOYING PLURAL TUNING SHEETS AND A HAND-HELD SELECTOR
Ernest A. Zadig, 1 Bouton St., South Norwalk, Conn.
Filed May 21, 1969, Ser. No. 826,440
Int. Cl. G10b *15/02*
U.S. Cl. 84—471 **6 Claims**



A device for producing selected tones includes an electrically operated tone generator which includes a stylus and a

plurality of terminals for producing tones by completing a circuit through the stylus and the one of the terminals that will cause the desired tone to be produced. A separate conductor for each terminal is on a sheet and extends to one edge. Each conductor is uninsulated at a portion at said edge, and at least at one other point. By folding the edge portion of the sheet each conductor will have an uninsulated portion at both the upper and under side s of the sheet for making contacts with similarly arranged conductors on another sheet, above or below, if a number of the sheets are stacked. A contact board has contacts connected respectively to the tone generator terminals and arranged to contact respective conductors on one or more sheets by placing the board against the edge portion of one or more of the sheets. A selected tone is produced by contacting the stylus with an uninsulated point on one of the conductors on a sheet.

3,592,099
SLIDE RULE FOR COMPUTING MUSICAL RELATIONSHIPS
Delbert F. Gibby, 1600 Maxzim, Fullerton, Calif.
Filed Apr. 11, 1969, Ser. No. 815,283
Int. Cl. G09b *15/02*
U.S. Cl. 84—473 **10 Claims**

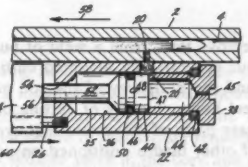


A slide rule capable of computing through mathematical constants substantially all significant musical relationships as they apply to any given key including chord structure and interval patterns of major and relative minor diatonic scales. The slide rule comprises a plurality of slidable members on the face and the back in cooperation with at least one stationary member, and may be linear or circular in form. A variety of marks and symbols representing musical tones, scales and chords are geometrically inscribed upon the moveable and stationary members so as simultaneously to depict an array of relationships, including interval patterns of major and relative minor diatonic scales and multiple chord combinations and variations applicable thereto in any major or relative minor key.

3,592,100
BINDING SCREW HAVING ELECTRICALLY INSULATED HEAD
Czeslaw Mackiewicz, Trumbull, and James E. Meehan, Bridgeport, both of, Conn., assignors to Harvey Hubbell, Incorporated, Bridgeport, Conn.
Filed May 9, 1968, Ser. No. 727,939
Int. Cl. F16b *23/00, 35/00*
U.S. Cl. 85—1 **5 Claims**

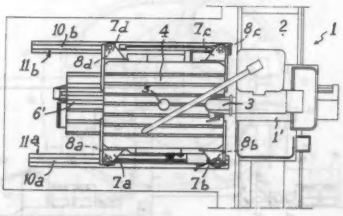
A binding screw having a threaded shank and an enlarged head coated with a plastic insulating material. The head includes a usual slot which is cut through the insulating material exposing the base metal.

3,592,101
GAS SYSTEM FOR AUTOLOADING FIREARM
Edwin S. Vartanian, North Haven, and Jay P. Jarvis, Madison, both of, Conn., assignors to Olin Corporation
Filed Apr. 21, 1969, Ser. No. 817,770
Int. Cl. F41d *5/08, 5/10*
U.S. Cl. 89—193 **7 Claims**



A gas system for an autoloading firearm wherein the gas piston is operative to seal the gas cylinder against high-pressure combustion gases during early stages of recoil of the firearm after firing thereof. As the force of recoil decreases, the seal is broken and lower pressure gases are bled into the gas cylinder to actuate the gas system.

3,592,102
ROTATABLE INDEXING PLATE FOR A MACHINE TOOL
Charles William Berthiez, 5 Avenue Eglantine, Lausanne, Switzerland
Filed Jan. 24, 1969, Ser. No. 793,716
Claims priority, application France, Feb. 2, 1968, 138,559
Int. Cl. B23d *7/08*
U.S. Cl. 90—56 R **8 Claims**



An indexing plate for a machine tool rotatable about a vertical axis on a support resting in a foundation including horizontal support surface means positioned in the foundation, vertical jack means are mounted between said support surface means and the periphery of said plate and said jack means are capable of simultaneously contacting said support surface means and said plate to support said plate. In one embodiment four jacks are provided in the plate whose axes

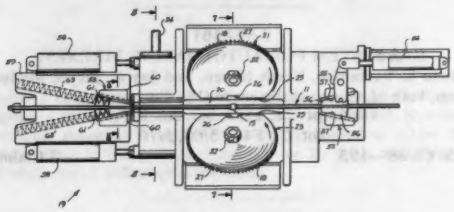
pass through the plane of the plate at the corners of a square centered on the axis of rotation of the plate and the support surface means includes four support shoes mounted in pairs on rails.

3,592,103

APPARATUS FOR REMOVING MATERIAL FROM A WORKPIECE

William B. Brown, Pasadena, Md., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed June 11, 1969, Ser. No. 832,349
Int. Cl. B23d *41/06, 37/14*
U.S. Cl. 90—88 **9 Claims**



In order to remove flash from a weld of butt-welded sections of rod, four eccentrically mounted cutting wheels are positioned around the periphery of the rod adjacent to the weld. Each wheel has a plurality of cutting blades attached thereto which have paths of movement that overlap the paths of movement of other blades positioned on adjacent wheels when the blades are in cutting engagement with the flash. Each wheel is relieved along a chord thereof to form a straight section for initially accommodating the welded sections of rod before the milling operation is commenced. The eccentric mounting arrangement results in progressively deeper milling of the flash as the wheels are rotated.

ERRATUM

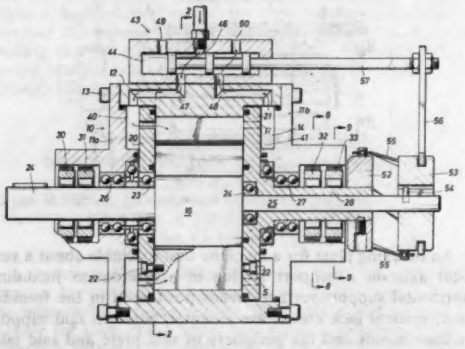
For Class 91—170 see:
Patent No. 3,592,107

3,592,104

FLUID MOTOR

James H. Harness, Houston, Tex., assignor to Harness Power Associates, Houston, Tex.

Filed Oct. 17, 1969, Ser. No. 867,182
Int. Cl. F01b *15/00;* **F01c** *9/00*
U.S. Cl. 91—196 **7 Claims**



A motor is disclosed that has abutment vanes and power vanes moving around an annular chamber. Fluid under pressure is first injected between an abutment vane and a power vane while exhausting the other sides thereof to move the vanes apart. Then the pressure fluid is injected on the outer sides while the space between them is exhausted to move them together. This switching of the injecting and exhausting functions is determined by the relative position of the vanes.

ERRATUM

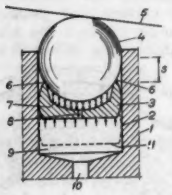
For Class 91—276 see:
Patent No. 3,592,109

3,592,105

HYDROSTATIC PUMP OR MOTOR WITH SPHERICAL PISTON

Per Fryklund, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed July 17, 1969, Ser. No. 842,522
Claims priority, application Sweden, July 23, 1968, 10,013
Int. Cl. F01b *13/00;* **F16j** *1/24*
U.S. Cl. 92—54 **3 Claims**



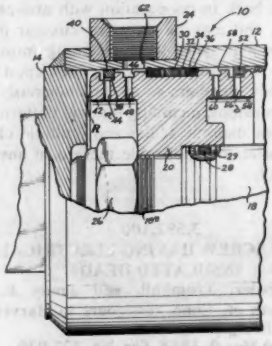
A hydraulic energy converting device applicable to both pumps and motors, such devices employing an obliquely pivoted swash plate to interact with a spherical piston. The axial component of the force on the piston causes wear. This wear is minimized by providing a bowl-shaped piston with a ball-contacting seat and interposing a ball between the piston and the swash plate. Pressure-communicating arrangements in the piston permit fluid pressure and the ball to interact directly, minimizing the force of contact between ball and seat.

3,592,106

RAM WITH CUSHIONED PISTON STROKE

Gaylord G. Baughman, Troutdale, Oreg., assignor to Cascade Corporation, Portland, Oreg.

Filed June 25, 1969, Ser. No. 836,533
Int. Cl. F01d *11/02*
U.S. Cl. 92—85 **7 Claims**



A ram with a construction for cushioning the ram's piston as it nears the end of a stroke while accommodating a fast

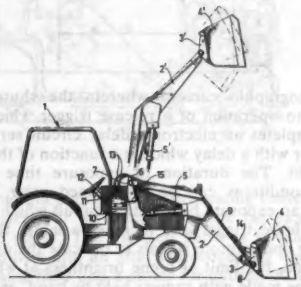
return stroke in the piston. A metallic piston ring is loosely mounted to permit limited axial movement within an annular groove on the piston. A fluid passage connects this groove with an end of the piston. The ring on movement of the piston toward the end of a stroke moves to a position tending to close off the fluid passage, to capture cushioning fluid. With pressure fluid admitted to the ram to produce a return stroke, the ring shifts axially to a position tending to open up the fluid passage.

3,592,107

HYDRAULIC CONTROL SYSTEM

Gosta Ahlenius, Oppange, Enanger, Sweden, assignor to Broderna Lundbergs Mekaniska Verkstad AB, Sweden

Filed June 2, 1969, Ser. No. 829,655
Claims priority, application Sweden, June 6, 1968, 7645/68
Int. Cl. F01b *1/00*; B66f *9/00*; F02f *3/62*
U.S. Cl. 91—170 R 13 Claims



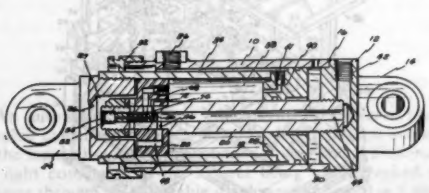
Hydraulic control system producing parallel linkage of a toolholder located on control arms actuated by means of a hydraulic cylinder mechanically coupled between the toolholder and the control arms, the control units for said arms being allotted a hydraulic valve containing a supervisory unit detecting the movements of the arms and in dependence on the direction of movement of said arms, permitting the passage of fluid to a hydraulic unit allotted to said valve, said unit assuming a first position for the passage of fluid to one side of the cylinder on movement of the control arms in one direction under the influence of said fluid, and a second position for passage of fluid to the other side of the cylinder on movement of the control arms in the opposite direction.

3,592,108

FLUID CYLINDER

Borje Oscar Rosaen, 4031 Thornoaks, Ann Arbor, Mich., and Robert L. Firth, 4817 Sunnyslope Road, Minneapolis, Minn.

Continuation-in-part of application Ser. No. 660,454, Aug. 14, 1967, now Patent No. 3,335,642, dated Aug. 15, 1967.
This application Feb. 7, 1969, Ser. No. 797,420
Int. Cl. F01b *31/00*
U.S. Cl. 92—110 12 Claims



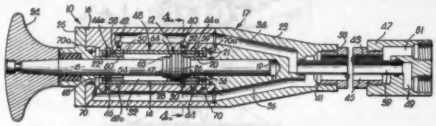
A fluid cylinder comprising inner and outer tubular members telescopically joined for relative movement between extended and retracted positions. A piston carried by the outer tubular member is slidably disposed in the inner tubular member and the inner end of the inner tubular member forms a second piston. Ports and passages are provided to selectively direct fluid to the areas on opposite sides of each of the two pistons. Various valving arrangements are employed to regulate fluid flow between the various chambers formed within the cylinder to thereby regulate the speed of extension and retraction.

3,592,109

RECIPROCATING FLUID MOTOR

Wade A. Eskridge, Overland Park, Kans., assignor to A. B. Chance Company, Centralia, Mo.

Filed Mar. 5, 1969, Ser. No. 804,500
Int. Cl. F01l *17/00*, *25/04*; F15b *15/22*
U.S. Cl. 91—276 8 Claims



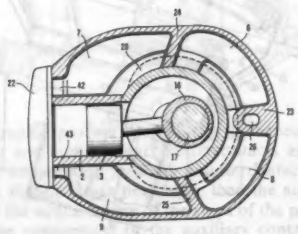
A reciprocating fluid motor has a piston shiftably carried in the bore of a longitudinally extending housing. The piston includes an axial rod projecting from the housing that is adapted for attachment to mechanism requiring reciprocable drive. A freely slidable valve in the bore and shiftable by the piston alternately admits fluid pressure to opposite sides of the piston to shift the same in opposite directions. Interfitting parts on the valve and on the piston cooperate to create an imbalance of pressure on opposite sides of the piston adjacent each end of its path of reciprocation in a direction and of a magnitude sufficient to insure shifting of the valve.

3,592,110

MOTOR COMPRESSOR PARTICULARLY FOR SMALL REFRIGERATING MACHINES

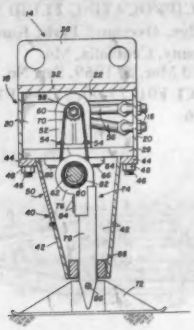
Bendt Wegge Romer, Ulkebol; Vagan Valbjorn, Nordborg, and Bent M. K. Holme, Skovby, all of, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Aug. 5, 1969, Ser. No. 847,637
Int. Cl. F01b *29/00*
U.S. Cl. 92—161 9 Claims



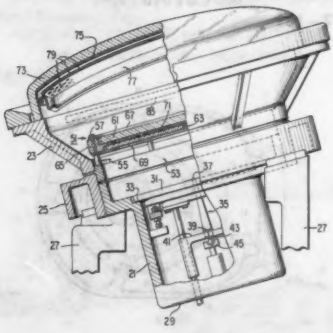
The invention relates to a motor compressor assembly of the type used for small refrigerating machines. It involves a construction for forming noise-reducing chambers wherein the chambers are formed between recesses in a central bore of the casing and a cup shaped element inserted in the central bore. Grooves are formed in the central bore which are covered by the peripheral wall of the insert and the grooves form passages connecting the noise reducing chambers.

3,592,111
COMPACTOR
Johnston R. Livingston, Dallas, and George C. Whitus, Grand Prairie, both of, Tex., assignors to Construction Technology, Inc., Arlington, Tex.
Filed Apr. 1, 1969, Ser. No. 811,753
Int. Cl. E01c 19/30
U.S. Cl. 94—49 7 Claims



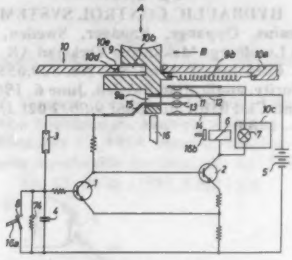
A material compactor for use with backhoes and the like. The compactor includes a box frame adapted for attachment to a backhoe and a hydraulic motor rigidly supported within the box frame. A shaft is rotatably supported on the frame beneath the motor. The shaft extends horizontally and is directly coupled to the motor by a chain and sprocket drive. A pair of connecting rod assemblies are eccentrically mounted directly on the shaft and extend downwardly therefrom to a pair of compactor shoes.

3,592,112
PHOTOGRAPHIC PRINTING OF CATHODE-RAY TUBE SCREEN STRUCTURE
Harry Robert Frey, Lancaster, Pa., assignor to RCA Corporation
Filed July 25, 1969, Ser. No. 844,852
Int. Cl. G03c 7/00; H01j 1/62, 29/89
U.S. Cl. 95—1 R 10 Claims



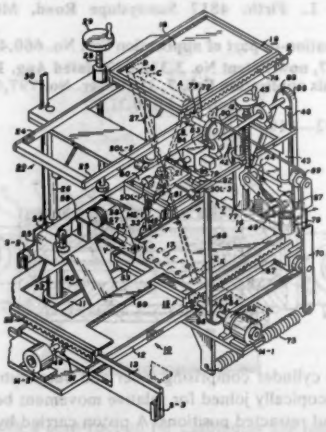
During the fabrication of a cathode-ray tube screen structure, a light field is projected through a photographic master, a correction lens and an optical filter incident upon a photosensitive layer. The filter is a relief image comprised of preformed, nonmetallic, light-absorbing particles having a mean diameter in the range of 5 to 50 millimicrons in a light-transmitting binder. The filter has variations in light transmittance which produce predetermined variations in light intensity in the light filed tailored to the particular system.

3,592,113
CAMERA WITH MEANS FOR INDICATING AUTOMATICALLY DETERMINED EXPOSURE TIMES
Erwin von Wasielewski, Munich, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Sept. 13, 1967, Ser. No. 667,396
Claims priority, application Germany, Sept. 21, 1966, A 53 550
Int. Cl. G03b 7/08; G01j 1/46
U.S. Cl. 95—10 C 22 Claims



A photographic camera wherein the shutter opens in response to operation of a release trigger which simultaneously completes an electronic delay circuit serving to close the shutter with a delay which is a function of the intensity of scene light. The duration of exposure time under given lighting conditions can be determined prior to or in the course of an exposure by a testing circuit which is completed by the release trigger and includes a lamp, flag or buzzer producing one or more signals to indicate the duration of exposure time, the limit of scene brightness at which an exposure can be made with camera held by hand, and/or the limit of scene brightness at which an exposure can be made with camera mounted on a fixed support. The duration of signals may be a fraction or a multiple of the corresponding exposure time. The absence of a signal can indicate satisfactory scene brightness for exposures with camera held by hand and a continuous signal can indicate that the intensity of scene light is unsatisfactory. Changes in frequency and/or duration of recurring signals can indicate different exposure times.

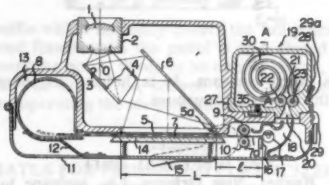
3,592,114
APPARATUS FOR JUSTIFYING A REPRODUCED LINE OF CHARACTERS
Ernest Everet Minett, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Division of Ser. No. 468,698, July 1, 1965. This application Oct. 3, 1968, Ser. No. 764,851
Int. Cl. B41b 19/00, 23/00
U.S. Cl. 95—4.5 J 9 Claims



Apparatus for justifying a line of printed matter including a planar support for an original document to be justified posi-

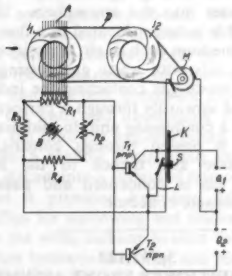
tioned in an optical path relative to a planar support for a sensitized recording member such that an original document is scanned to project a justified image onto the recording medium. The justifying apparatus includes an asymmetric lens supported by a lens carriage positioned intermediate the original document support and the recording member support and movable at a synchronous speed related to a scanning mechanism to expand or contract the graphic data for justifying the image onto the recording medium.

3,592,115
ELECTRONIC PHOTOGRAPHIC CAMERA
Sadanao Ando, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Dec. 9, 1968, Ser. No. 782,081
Int. Cl. G03b *17/50*
U.S. Cl. 95—13 **2 Claims**



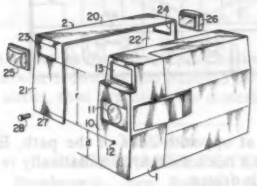
An electronic photographic and processing camera having an optical system for inverting an image for exposure on photosensitive paper. The exposed paper is advanced after exposure by rollers into an attached processing unit that includes processing fluid and a cutter for cutting off individual exposures. The processing unit is detachable from the camera and includes additional rollers to seal the fluid therein.

3,592,116
AUTOMATIC DIAPHRAGM ADJUSTMENT FOR A PHOTOGRAPHIC CAMERA
Arno Ritze, Stuttgart-Mohringen, Germany, assignor to Zeiss Ikon Aktiengesellschaft, Stuttgart, Germany
Filed Sept. 10, 1969, Ser. No. 856,580
Claims priority, application Germany, Sept. 28, 1968, P 17 97 443.5
Int. Cl. G03b *19/18*
U.S. Cl. 95—64 R **4 Claims**



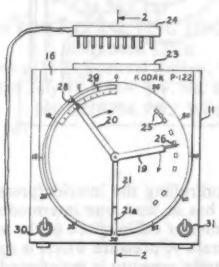
An automatic diaphragm adjustment device for a photographic camera in which a photoconductive cell is arranged in the input circuit of a Wheatstone bridge and is illuminated by light coming from the subject being photographed and passing through an adjustable diaphragm arranged in front of the photoconductive cell. The diaphragm is operatively connected with the adjustable diaphragm of the camera objective and with an electric motor. A transistor amplifier having at least two transistors is arranged in the diagonal of the Wheatstone bridge and controls the electric motor rotating it in one or the other direction as the case may be until the bridge is balanced. One of the transistors is bridged by a conductor including a manually operable switch, so that when the switch is closed the diaphragm is closed by the electric motor.

3,592,117
GRIP OF A CAMERA
Masahiro Fukuda, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd, Ashigara-Kamigun, Kanagawa, Japan
Filed July 28, 1969, Ser. No. 845,449
Claims priority, application Japan, Aug. 28, 1968, 43/61626
Int. Cl. G03b *17/56*
U.S. Cl. 95—86 **3 Claims**



A U-shaped grip carrying a viewfinder is pivotally mounted to the camera. The grip is used as a grip for supporting the camera when not taking the picture and acts as a lens cover when carrying the camera but is used as a viewfinder when taking pictures.

3,592,118
PHOTOGRAPHIC PROGRAM TIMER
Werner W. Buechner, 4407 Gladding Court, Midland, Mich.
Continuation of application Ser. No. 677,265, Oct. 23, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 302,902, Aug. 19, 1963, now Patent No. 3,349,685, and a continuation-in-part of 621,382, Jan. 23, 1967, now Patent No. 3,538,270. This application Apr. 20, 1970, Ser. No. 28,254
Int. Cl. G03d *3/00*
U.S. Cl. 95—89 **10 Claims**

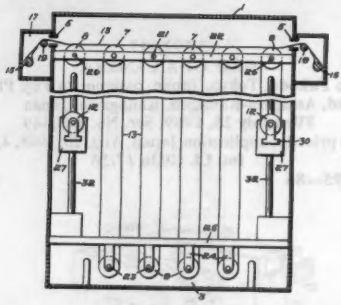


A photographic process timer of the dual-speed type having contacts and cooperating countercontacts and auxiliary contact and cooperating auxiliary countercontact. The contacts have a slightly larger time value than the auxiliary contact, so that the actual timing of the steps of the process is effected by the engagement of the auxiliary contact countercontact pair.

3,592,119
FILM-PROCESSING MACHINE
Ralph G. Matheson, 178 Essex Ave, Gloucester, Mass.
Filed Apr. 21, 1969, Ser. No. 817,728
Int. Cl. G03d *3/12*
U.S. Cl. 95—94 **8 Claims**

A film-processing machine in which a strip of film is driven back and forth through a tank of processing solution. The

ends of the film remain fixed while rollers drive the intermediate portion. To take up slack and maintain tension, two gravitationally biased guide rollers are mounted on vertically



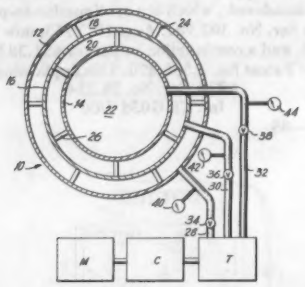
moving carriages at opposite ends of the path. Each of the carriages operates a microswitch, automatically reversing the direction the film is driven.

3,592,120

PROCESS OF PRESSURIZATION OF AIRCRAFT, WITH DIFFERENT PRESSURE VALUES IN ITS VARIOUS COMPARTMENTS

Carlos Cudell Goetz, Avenida Luiz Bivar 36-50 Esq, Lisbon, Portugal

Filed Aug. 2, 1968, Ser. No. 749,626
Claims priority, application Portugal, Aug. 16, 1967, 48206
Int. Cl. B64d *13/04*
U.S. Cl. 98—1.5 **4 Claims**



A method for controlling the interior pressure of an aircraft. The aircraft has at least one intermediate space situated between the interior cabin space of the aircraft and the exterior of the aircraft. A pressure which is substantially different from the outside pressure is maintained within the interior cabin space while there is simultaneously maintained in the intermediate space a pressure between the pressure in the interior cabin space and the outside pressure. In this way the transition from the inside to the outside pressure is more gradually distributed, thus making it possible for pressurized fuselage structures to be used at altitudes and pressure higher than would normally be expected.

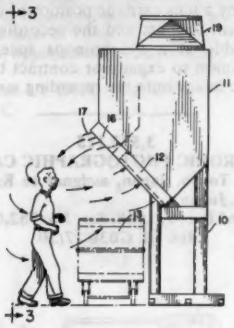
3,592,121

COMPENSATING HOOD APPARATUS

Alvin S. Lundy, Bloomfield Hills, Mich., assignor to Claude B. Schneible Co., Holly, Mich.

Filed June 23, 1969, Ser. No. 835,340
Int. Cl. F23j *11/00*
U.S. Cl. 98—36 **3 Claims**

Supply air, which is preferably outside air, is discharged to form an air curtain between an operator and a mold pourer, etc., joining a rising column of gas, dust, etc., to direct the column toward an exhaust intake, and adjustable means are provided for directing the air curtain outwardly to cool the



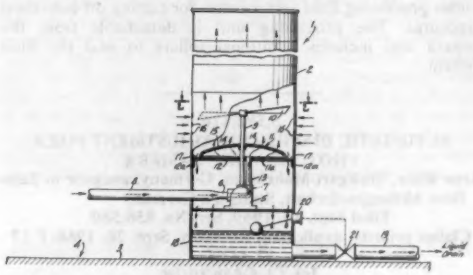
operator in warm seasons. It is helpful to increase the velocity of the air for this purpose.

3,592,122

GAS DISPERSAL UNIT

Leonard H. Hughes, New Orleans, La., assignor to Texaco Inc., New York, N.Y.

Filed June 26, 1971, Ser. No. 836,702
Int. Cl. E04f *17/02*
U.S. Cl. 98—58 **7 Claims**



An apparatus for diluting a waste, flue gas prior to discharging the latter into the atmosphere. The apparatus comprises a rotatable inductor located in a flue. A source of a gaseous diluting medium such as air, is positioned upstream of the inductor to mix with waste gas passing through the latter prior to the waste gas contacting the inductor blades. Waste gas is passed upwardly through a perforated manifold which functions as a condensing unit. In said manifold, a part of the gas flow is passed through constrictions in the manifold upper side and thence to the inductor, the remainder of the gas is condensed and passed from the manifold to a condensate collector.

3,592,123

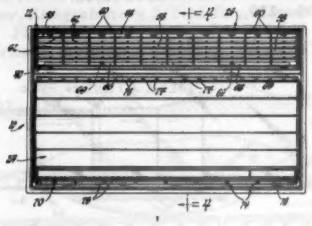
AIR CONDITIONER FRONT ASSEMBLY

Ferdinand C. Henken, Kettering, and Emerson L. Wark, Vandalia, both of, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 19, 1969, Ser. No. 886,641
Int. Cl. E06b *7/02*
U.S. Cl. 98—94 **3 Claims**

In preferred form an air conditioner front assembly including a unitary plastic member having a first outer frame adapted to be connected to the cabinet of an air conditioner unit. A discharge sleeve extends across the width of the frame at the top thereof and a second frame is supported in front of the first frame by a plurality of reinforcing ribs that

define an inlet opening above, below and to each side of the frame for flow of return air across a filter element secured on the frame at an outlet opening on the front. The second frame includes a pair of spaced-apart parallel tracks in which slots are formed that receive spring-biased tabs on an imperforate baffle which normally covers the full planar extent of the second frame when the panel is in a closed position to damp operating noise. When in an open position, the panel is moved to one side of the second frame to uncover control means for operating the air conditioner.

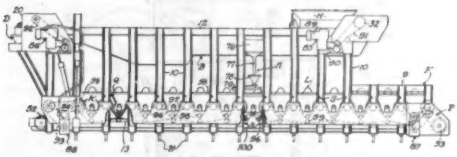


3,592,124

APPARATUS FOR PRODUCING PLASTICIZED CHEESE FROM RAW CURD

Nicholas E. Pontecorvo, Tarzana, and Wilfred A. Shaffer, Los Angeles, both of, Calif., assignors to American Foods Machinery Corporation

Division of Ser. No. 601,177, Dec. 12, 1966, Pat. No. 3,445,241 which is a continuation-in-part of application Ser. No. 489,833, Sept. 24, 1965, now Patent No. 3,403,030, dated Sept. 24, 1968.
Divided and this application Nov. 1, 1968, Ser. No. 792,877
Int. Cl. A23c *19/02*
U.S. Cl. 99—243 **3 Claims**



Apparatus for processing raw cheese curd into compact, homogeneous and plasticized cheese. The apparatus is provided with means including an elevated hot water bath for softening the curd, a conveyor belt for moving the cheese curd through the bath, means for conveying the curd in a shallow layer onto the belt, means for elevating the softened curd out of the bath and discharging it downwardly, and means below the bath for agglomerating the softened curd, forming it into a shallow horizontally moving stream, and kneading the stream into a ribbon of homogeneous cheese. In the apparatus is provided kneading rolls, a plurality of gathering baffles for narrowing and thickening the curd ribbon between the rolls, radiant heaters for applying heat to the curd ribbon between the rolls, and means for delivering fine water mist sprays on the kneading rolls.

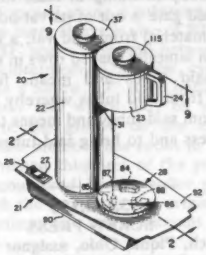
3,592,125

AUTOMATIC INFUSION BREW MAKER

Robert J. Tolmie, Fairfield; Robert L. Rubenstein, Norwalk, and Theodore R. Flowers, Fairfield, all of, Conn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 4, 1969, Ser. No. 804,159
Int. Cl. A47j *31/00*
U.S. Cl. 99—307 **15 Claims**

An automatic infusion brew maker comprising a pair of reservoirs and a pair of heat pumps connected thereto. The two heat pumps are driven by a common electrical heating means. Water from the first reservoir is pumped into a removable steeping basket, passes through a filter and exits through an outlet below the steeping basket. Water from the second reservoir is heated and pumped directly to the steeping basket outlet, thus bypassing the material to be steeped.

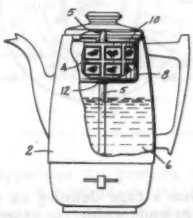


3,592,126

COFFEEMAKER FILTER

Eugene S. Dombrowik, New Britain, Conn., assignor to General Electric Company

Filed Dec. 19, 1969, Ser. No. 886,442
Int. Cl. A47j *31/08*
U.S. Cl. 99—312 **7 Claims**



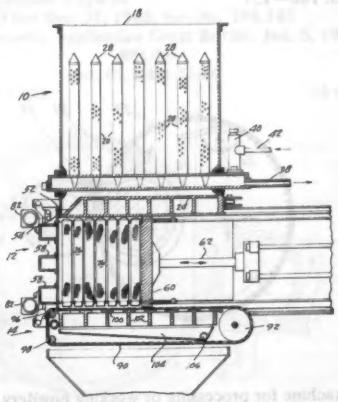
A coffeemaker filter basket wherein the sidewalls of the filter have smaller openings than the bottom wall of the filter.

3,592,127

APPARATUS FOR EXTRACTING JUICE FROM FRUIT AND THE LIKE

William L. Cooley, 1415 Squirrel Hollow, Saratoga, Calif.

Filed July 18, 1969, Ser. No. 851,130
Int. Cl. B30b *9/02, 9/06*
U.S. Cl. 100—107 **11 Claims**



Apparatus for extracting the juice from fruit and the like, said apparatus comprising a vat to receive material to be treated; a plurality of laterally spaced vertical perforated

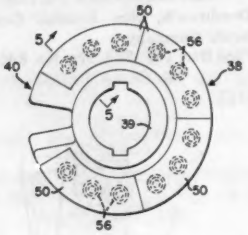
drainage tubes; manifolds receiving juice from said vertical tubes; an outlet connected to said manifolds; a gate forming a bottom for said vat; means for moving said gate into and out of position whereby to dump at least the lower portion of said vat when said gate is out of its vat-bottoming position; a press receiving material from said vat; a plurality of vertical drainage tubes in laterally spaced rows in said press, drainage means below said tubes and means for separating said drainage means from said tubes whereby to permit dumping of the residue from said tubes and means to compress material inside said press and to bring said tubes into mutual close juxtaposition.

3,592,128

SCREW PRESS

Alfred W. French, Piqua, Ohio, assignor to The French Oil Mill Machinery Company, Piqua, Ohio

Filed June 6, 1968, Ser. No. 735,050
Int. Cl. B30b *3/00, 3/02*
U.S. Cl. 100—145 **12 Claims**



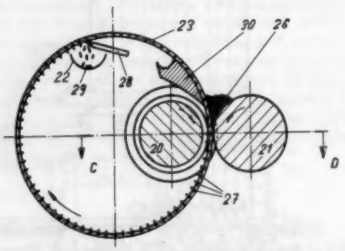
A screw press has a cage defining an elongated pressing chamber, a screw extends within the chamber and has a plurality of worm bodies supporting a series of axially spaced helical flights receiving stationary breaker bars therebetween, and the flights have a hardened insert member removably connected to the corresponding body for resistance to wear and convenient reconditioning of the screw.

3,592,129

MACHINE FOR PROCESSING POWDER OR PASTELIKE MATERIALS INTO A GRANULATE OR THE LIKE

Heinz List, St. Jakobstrasse 43, Pratteln, Switzerland

Filed Apr. 22, 1968, Ser. No. 722,832
Int. Cl. B30b *3/04*
U.S. Cl. 100—157 **4 Claims**



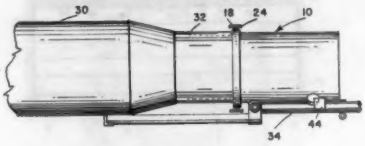
A machine for processing or working powdery or pastelike materials into a granulate at the wedge gap between two opposite rotating rollers. A forming ring member rotates between the rollers, and the forming means are arranged at such ring member.

3,592,130

TRANSFER SLEEVE

Daniel Q. Boje, Staten Island; Samuel Taylor Permutt, Jamaica Estates, Queens, and Sol Kestin, Bronx, all of, N.Y., assignors to Compactor Corporation

Filed June 30, 1969, Ser. No. 837,743
Int. Cl. B30b *15/08*
U.S. Cl. 100—229 **13 Claims**



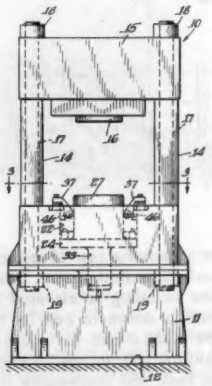
A transfer sleeve comprising an open ended hollow body adapted to be disposed at the discharge end of a compacting device, for extending the compacted waste storage capacity of waste compactors prior to removal of the waste or refuse receptacles and for improving the means for removing the refuse receptacles. Alternatively, the transfer sleeve can be used for transferring and storing any other materials flowable therethrough.

3,592,131

HYDRAULIC CYLINDER APPARATUS

Tsuruo Otsuka, Harvey, and Eugene E. Grankowski, Chicago, both of, Ill., assignors to Verson Allsteel Press Company, Chicago, Ill.

Filed June 11, 1969, Ser. No. 832,195
Int. Cl. B30b *1/32*
U.S. Cl. 100—269 **10 Claims**



A hydraulic cylinder apparatus for a hydraulic press effectively provides in itself the hydraulically movable platen of the press. A hollow hydraulic cylinder body which is open at one end and closed at the other has a cylinder of large diameter at the open end and a cylinder of small diameter at the closed end communicating with the cylinder of large diameter substantially midway between the ends of the cylinder body. A piston body is longitudinally movably received in the cylinder body and it has intermediate its ends a piston of large diameter in the large diameter cylinder, a piston extension of small diameter in the small diameter cylinder and a ram extension of intermediate diameter extending through the open end of the cylinder body and effectively providing the hydraulically movable platen of the hydraulic press. Hydraulic packing is carried by the piston of large diameter and engages the cylinder of large diameter for hydraulically sealing the piston body in the cylinder body. Guide means is provided between the cylinder of small diameter and the piston extension for guiding longitudinal movement of this end of the piston body, and guide means is

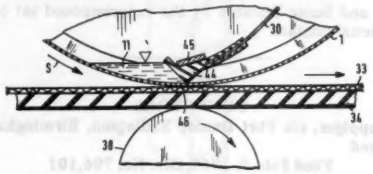
provided between the cylinder of large diameter and the ram extension for guiding longitudinal movement of this end of the piston body.

3,592,132

ROTARY FORAMINOUS PRINTING MACHINE WITH MAGNETICALLY ATTRACTED INTERNAL INKER

Erich Weber, Eichgrabenweg 2, Feldafing, Germany

Filed Nov. 27, 1968, Ser. No. 779,542
Claims priority, application Germany, Nov., 1967, P 16 10 300.7
Int. Cl. B41l *13/04*
U.S. Cl. 101—119 9 Claims



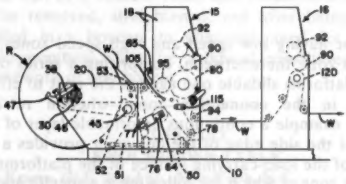
The specification describes a foraminous printing apparatus in which a squeegee inside a screen or stencil cylinder is flexible in the direction of its length and is adapted to be attracted by a magnet placed under the screen cylinder.

3,592,133

PRINTING APPARATUS

Henry C. Webendorfer, and Louis Schriber, both of Dayton, Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Nov. 12, 1968, Ser. No. 774,773
Int. Cl. B41f *13/54*
U.S. Cl. 101—228 4 Claims



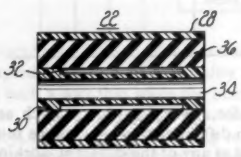
A web of material is fed from a supply roll around a tension control roll to a printing unit including a large diameter cylinder having a high friction outer surface. Guide rolls provide for a substantial wrap of the web around the cylinder, and gripping rollers press the web against the outer surface so that rotation of the cylinder effects precise metering of the web from the supply roll through the printing unit and other units which perform successive operations on the web.

3,592,134

IMPRINTER UTILIZING COMPENSATING ROLLER PLATEN

James M. Patterson, Jr., Fairfax County, Va., assignor to Farrington Business Machines Corporation, Springfield, Va.

Filed Apr. 30, 1968, Ser. No. 725,292
Int. Cl. B41f *3/20*
U.S. Cl. 101—269 13 Claims



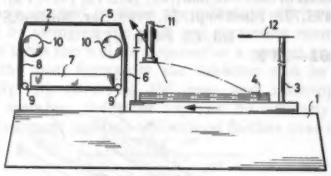
Disclosed is an imprinter for printing upon documents from a printing plate, the imprinter utilizing a compensating roller platen. The platen may be of the dry roll-type and includes a plastic or nylon outer sleeve of typically 80 to 90 durometer hardness, Shore "D" scale. An inner sleeve is also provided, the inner sleeve being rotatably mounted with respect to the imprinter carriage. This sleeve has a peripheral grooved portion disposed along a substantial portion of the length thereof. The inner sleeve is also of 80 to 90 durometer hardness, Shore "D" scale. Disposed between the inner and outer sleeves is an intermediate, annular, cylindrical resilient member which has a Shore "D" scale hardness of typically 40 to 45 durometer and which may be may be made of rubber. Because of the groove on the inner sleeve, the resilient intermediate member has room in which to retract whenever the combined thickness of the printing plate and the document encountered by the roller platen is greater than that for which the imprinter was originally set. Thus, a wide range of printing plate and document thicknesses may be accommodated.

3,592,135

APPARATUS FOR PRINTING BOUND STAPLED OR GLUED BOOKS

Hans Geltermair, Baiertal near Wiesloch, Germany, assignor to Adnumat-Geralebaugesellschaft MBH 2 Co., Heiligenstadt, Germany

Filed Oct. 8, 1968, Ser. No. 765,881
Claims priority, application Belgium, Oct. 16, 1967, 49672
Int. Cl. B41f *1/06*
U.S. Cl. 101—287 16 Claims



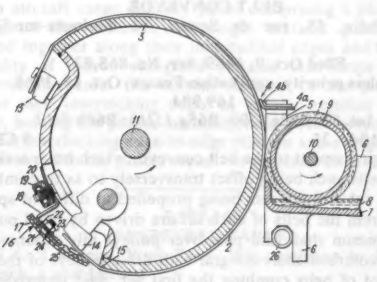
An improved apparatus for printing bound, stapled or glued books, and more particularly check books and other stacked sheets, wherein a printing and stamping device and the stacked sheets carry out two reciprocating movements relative to each other and parallel and perpendicularly to a printing plane, and wherein in one of two end positions of the relative parallel movement, corresponding to one of the two end positions of the vertical relative movement, the printing is effected, whilst in the zone of the other end position of the relative parallel movement the individual sheets are raised after the printing by suction and are then pivoted into a plane tilted against the printing plane and held in this position.

3,592,136

OFFSET PRINTING APPARATUS CLEANER

Thomas G. Selman, London, England, assignor to Gestetner Limited, London, England

Filed Dec. 31, 1968, Ser. No. 788,143
Claims priority, application Great Britain, Jan. 5, 1968, 881/68
Int. Cl. B41f *35/00*
U.S. Cl. 101—425 10 Claims



The invention relates to a device for cleaning a printing cylinder and comprising a roller for applying ink solvent to

the cylinder and a device for wiping excess solvent around the cylinder to be deposited on a solvent absorbent strip attached to the cylinder. The volatile solvent may subsequently evaporate to leave the strip once more absorbent.

3,592,137
PLANOGRAPHIC PRINTING PLATES

Douglas A. Newman, Glen Cove, N.Y., assignor to Columbia Ribbon and Carbon Manufacturing Co., Inc., Glen Cove, N.Y.

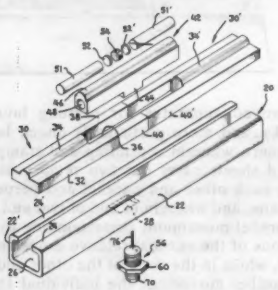
Filed Jan. 29, 1969, Ser. No. 795,047
Int. Cl. B41n *1/00, 3/00*
U.S. Cl. 101—462 **3 Claims**

An improved planographic printing plate based upon a polyvinyl alcohol binder material in the printing layer. The improvement resides in the incorporation of a certain amount of zinc oxide, relative to the amount of polyvinyl alcohol, in order to provide a printing layer which has an excellent hydrophilic-oleophilic balance, excellent ink-drying properties and avoids spreading of the oleophilic images on the plate surface.

3,592,138
ELECTRICALLY-ACTUATED, POWDER-OPERATED RAIL BONDING CONNECTOR

William F. Broske, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 608,781, Jan. 12, 1967, Pat. No. 3,495,778. Filed Sept. 25, 1969, Ser. No. 860,897
Int. Cl. F42b *3/12*
U.S. Cl. 102—28 R **1 Claim**



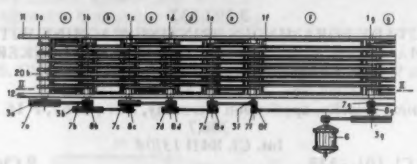
This disclosure relates to an explosively-operated connector for splicing current-carrying rail members. A pair of rails are abutted and the connector is secured thereto. An explosive is disposed within the connector and ignited electrically by a circuit containing a length of wire that develops ignition heat through electrical resistance. The detonation drives a pair of pistons which, in turn, drive a pair of wedge members contained in the connector, so that each of the wedge members secures one of the rails to the connector.

3,592,139
BELT CONVEYOR

Pierre Patin, 58, rue de Sevres, 92 Boulogne-sur-Seine, France

Filed Oct. 9, 1969, Ser. No. 865,037
Claims priority, application France, Oct. 15, 1968 169,984
Int. Cl. A63g *1/00;* **B65g** *15/12;* **B66b** *9/12*
U.S. Cl. 104—25 **9 Claims**

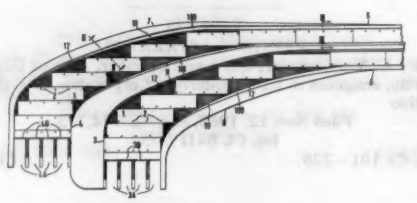
An improvement to the belt conveyor which has a series of sets of belts each being offset transversely so as to comb the adjacent set and the sets being propelled at different speeds and wherein the belts of each set are driven by fixed pulleys on a common shaft and pass over pulleys idly mounted on another common shaft integral with drive pulleys of the following set of belts combing the first set. Said improvement comprises an intermediate endless belt which is arranged between the drivable and freely rotatable pulleys of each set of belts and extends over substantially the width of the conveyor, said intermediate endless belt being grooved to allow the set of belts which pass over it to form a mutually finish surface and being drivable by the superimposed set of belts by frictional contact.



3,592,140
CONVEYORS

Paul Zuppiger, c/o Fort Dunlop Erdington, Birmingham 24, England

Filed Feb. 3, 1969, Ser. No. 796,101
Claims priority, application Switzerland, Feb. 2, 1968, 1629/68
Int. Cl. B65g *15/22, 17/12*
U.S. Cl. 104—25 **12 Claims**

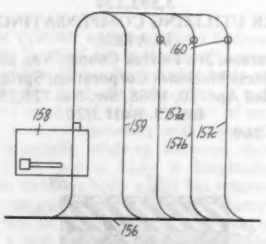


Conveyor having low speed and high speed zones, and a connection zone therebetween, comprising a series of load-carrying platforms slidable one against the next to effect acceleration in the connection zone, wherein retractable means, for example a continuous deformable layer of fingers mounted at the side edge of the conveyor provides a lateral extension of the load-carrying surface of the platforms in the connection zone of which the following is a specification.

3,592,141
CONVEYING DEVICE

Mats I. Davidson, Nygarden, Ganghester, Sweden

Filed Sept. 25, 1968, Ser. No. 762,539
Int. Cl. B61j *3/00*
U.S. Cl. 104—88 **26 Claims**



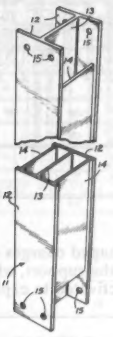
The device is for conveying objects such as semifinished products between different working stations in a transfer line and the personnel at any of the different working stations can direct a selected number of the semifinished products to other working stations in the transfer line by the manual actuation of a keyboard.

3,592,142

RAILWAY BOXCAR WITH REINFORCED END

William Don Miller, 922 American Bank Bldg., Portland, Oreg.

Filed June 30, 1969, Ser. No. 837,602
Int. Cl. B61d *17/06, 45/00*
U.S. Cl. 105—410 4 Claims



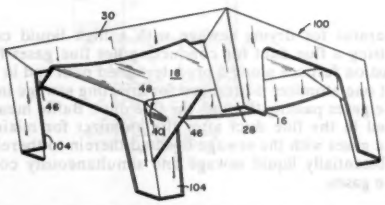
This is an improvement in railway boxcars that include a floor, a top, two sidewalls and two end walls defining the cargo space in said boxcars. The hammering induced on the end walls of a boxcar cannot be strongly braced to resist blows imposed by heavy cargo. This invention comprises the inclusion of a detachable bulkhead laterally spanning the distance between sidewalls and located inwardly of at least one end wall of a boxcar. Thus, said bulkhead element may easily be removed, straightened, and after being repaired, reinstalled in a boxcar, to eliminate need for repair of distorted members while the bulkhead constitutes a part of the framework of said boxcar.

3,592,143

KNOCKDOWN TABLE

Martin Krone, 60 E. 42nd St., New York, N.Y.

Filed Dec. 26, 1968, Ser. No. 786,895
Int. Cl. A47b *3/06*
U.S. Cl. 108—115 2 Claims



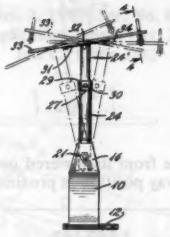
A knockdown table formed of a cardboard blank which has been adapted by means of a plurality of fold lines and score lines in such a way that when the blank is folded along said fold lines a table having an imperforate top will be defined thereby, the score lines defining removable sections which, when removed, are effective to form the legs of the table, and are further adapted to be delineated into corner locking and supporting members which will underlie and act as support for the resulting standing table structure.

3,592,144

UTILITY TABLE FOR AUTOMOBILES

James C. Futrell, 1007 Drake St., Roanoke Rapids, N.C.

Filed Oct. 16, 1969, Ser. No. 866,836
Int. Cl. A47b *37/00*
U.S. Cl. 108—44 6 Claims



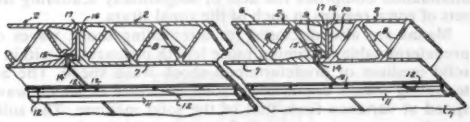
The invention is a utility table for use in an automobile, with such table having a base which may be curved to fit over the rounded cover for the shaft housing of the automobile ahead of the seat. A mounting member is swingably carried by the base and is provided with means for securing it in a definite position. A post with a tabletop at a slight angle at its upper end is detachably carried by the mounting member so that when in upright position the tabletop will be at a slight angle and by swinging the post and mounting member rearwardly the table top will be disposed at a greater angle but by swinging the post forwardly the tabletop can be disposed horizontally. By reversing the post and tabletop on the mounting member, the table top can be similarly disposed but in its rearmost position will extend farther over the seat.

3,592,145

FORCE-CARRYING INTERLOCK FOR ALUMINUM EXTRUDED PLATFORM

Gene A. Petry, New Carlisle, Ohio. Assignor to the United States of America as represented by the Secretary of the Air Force

Filed Aug. 15, 1969, Ser. No. 850,503
Int. Cl. B65d *19/00*
U.S. Cl. 108—51 3 Claims



An aircraft cargo delivery pallet comprising a plurality of elongated flat extruded lightweight metallic panels interlocked together along their longitudinal edges and having a plurality of spaced elongated metallic skid strips secured transversely across the bottom surfaces of the panels adjacent their interlocking edges in parallel relation to each other, holding the panels in substantially predetermined relative flat interlocking edge-to-edge relation and elongated side rails secured to the panels across the opposite ends thereof.

3,592,146

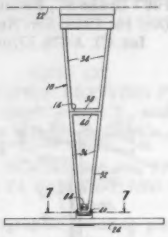
SUSPENDED TABLE

David C. Loomans, West Bend, Wis., assignor to Louis C. Riesch, a part interest

Filed May 14, 1969, Ser. No. 824,571
Int. Cl. A47b *5/00*
U.S. Cl. 108—149 11 Claims

A table suspended from the ceiling and provided with

suspension legs which are adapted to fold to thereby permit

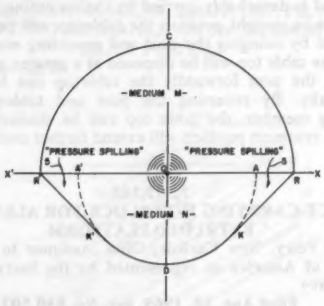


elevation of the table from its lowered usable position to an elevated out-of-the-way position in proximity to the ceiling.

3,592,147
METHOD AND MEANS FOR ATTENUATING SHOCK WAVES PROPAGATING WITHIN A SOLID

Edward Y. Harper, Los Altos, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed May 14, 1969, Ser. No. 824,586
Int. Cl. E04b *2/04*
U.S. Cl. 109—1 **5 Claims**



A method is disclosed for attenuating shock waves propagating within solids which waves are defined by an ambulatory three-dimensional zone of high stress comprising a plurality of parallel zonal strata oriented normal to the direction of wave propagation, each stratum comprising a plurality of interspersed sets of zonal regions. The method of attenuation comprises the acts of sequentially scattering the sets of zonal regions in each of the zonal strata.

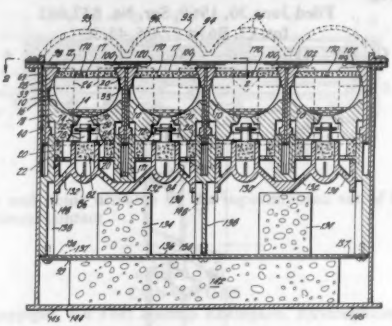
Means are also disclosed for attenuating shock waves of predeterminable maximum pulse length propagating within a solid medium of predetermined shock wave speed. The attenuating means comprises a solid structure of shock wave speed at variance from that of the solid medium. The solid structure comprises a set of juxtaposed protuberances in abutment with the solid medium which protuberances span the space between two substantially parallel planes spacially separated a distance in excess of the predeterminable shock wave pulse length.

3,592,148
EXPLOSIVE ARMOR

John R. Manis, 418 Millburn Ave., Millburn, N.J.

Filed Dec. 31, 1969, Ser. No. 889,549
Int. Cl. F41h *5/06*
U.S. Cl. 109—37 **17 Claims**

A plurality of freely tiltable, shaped explosive charge holding receptacles are positioned next to each other. Tilt causing strikers are positioned between adjacent charge receptacles. When a striker is depressed upon being struck by an incoming projectile, it tilts its receptacle toward the projectile and pushes that receptacle into the armor, causing detonation of the charge. In an alternate embodiment, the depressed striker acts on the charge detonator, rather than on the charge receptacle, to cause detonation. An automatic disarming apparatus for preventing explosion of neighboring charges is provided. Detonating devices for a set of neighboring shaped charges are mounted on a single support, which support is adapted to move all unactivated detonating devices away

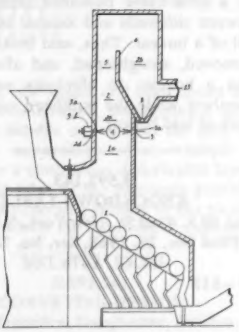


from their respective shaped charges upon the operation of a detonator mounted on the support, whereby other detonating devices would not be activated to explode their charges.

3,592,149
APPARATUS FOR PROCESSING SEWAGE

Reinhold Mutke, Erkrath-Unterbach, and Peter Steller, Duesseldorf, both of, Germany, assignors to Vereinigte Kesselwerke Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 25, 1969, Ser. No. 861,088
Claims priority, application Japan, July 16, 1969, 44/55787
Int. Cl. F23g *5/00*
U.S. Cl. 110—7 **13 Claims**



Apparatus for drying sewage with a high liquid content comprising a flue duct for conducting hot flue gases from a combustion furnace along a predetermined path and in which at least one atomizer is arranged for injecting sewage into the hot flue gases passing through the flue duct. Baffle means are provided in the flue duct after the atomizer for mixing the hot flue gases with the sewage injected therein to thereby dry the substantially liquid sewage and simultaneously cool the hot flue gases.

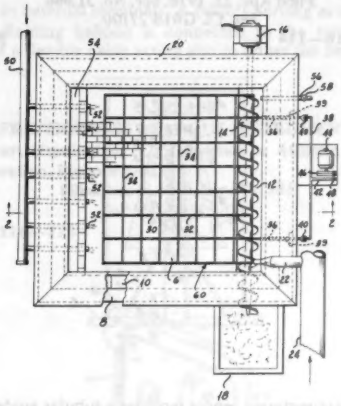
3,592,150
OPEN PIT INCINERATING METHOD AND APPARATUS

Robert P. Lanyon, Edison, and Carleton H. Boll, Rumson, both of, N.J., assignors to Separation Processes Corporation, Linden, N.J.

Filed Dec. 16, 1969, Ser. No. 885,569
Int. Cl. F23g *7/00*
U.S. Cl. 110—7-R **6 Claims**

Viscous liquid wastes having a high ash content are incinerated in an open pit incinerator having a hearth inclined upwardly from the point of introduction of the liquid wastes to the hearth. The liquid wastes are spread into a thin film by means of a reciprocating grid, and air for maintaining com-

bustion is introduced into the open pit over one of its walls through downwardly directed jets. An ash pit is provided ad-

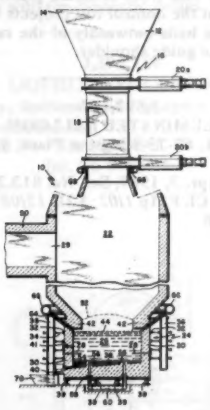


jacent the highest point of the hearth. Hot ashes may be quenched therein and removed from the pit by a conveyor.

3,592,151
METHOD AND APPARATUS FOR REFUSE INCINERATION

John J. Webber, Westboro, Mass., assignor to Morgan Construction, Worcester, Mass.

Filed Mar. 9, 1970, Ser. No. 17,854
Int. Cl. F23g 5/10
U.S. Cl. 110—8 E **10 Claims**

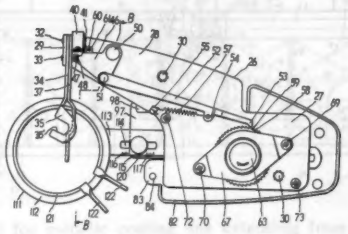


A method and apparatus for high-temperature incineration of refuse containing a random mixture of inert and combustible materials. The apparatus includes a combustion chamber having a tank at its base containing a high-temperature molten slag bath. The refuse, which may be initially subjected to drying and partial incineration in an auxiliary furnace, is deposited directly onto the surface of the molten slag bath. The combustible materials in the refuse are rapidly and completely incinerated either as they drop through the chamber, or as they subsequently float on the surface of the molten bath. The inert materials in the refuse are melted in the molten bath, thereby adding to the slag content of the tank while at the same time producing a small volume of molten metal which sinks to the bottom of the tank where it is eventually tapped off.

3,592,152
ATTACHMENT FOR EMBROIDERING INITIAL LETTERS, PATTERNS AND THE LIKE IN A ZIGZAG SEWING MACHINE

Saburo Shimada, and Nobutane Mori, both of Tokyo, Japan, assignors to Riccar Sewing Machine Co., Ltd., Chuo-ku, Tokyo, Japan

Filed Oct. 2, 1969, Ser. No. 863,080
Claims priority, application Japan, Oct. 23, 1968, 43/76821
Int. Cl. D05c 3/02
U.S. Cl. 112—102 **9 Claims**

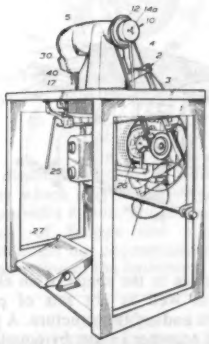


For embroidering initial letters and/or patterns by means of a zigzag sewing machine an attachment is fixed on the upper surface of the bed plate of a zigzag sewing machine for domestic use, and an oblong cam plate is actuated by making use of vertical motion of the needle bar. An embroidery frame carrying cloth is moved past the needle by means of a mechanism interlocking with said cam plate, thus embroidering initial letters and/or patterns.

3,592,153
MACHINE POSITIONING MEANS

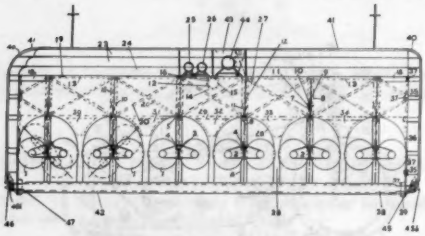
Gregory John Margereson, Pudsey, England, assignor to W. J. Clarkson Limited, Leeds, Yorkshire, England

Filed Mar. 17, 1969, Ser. No. 807,532
Claims priority, application Great Britain, Mar. 28, 1968, Apr. 22, 1968, 14892/68;18899/68
Int. Cl. D05b 69/22
U.S. Cl. 112—219 **7 Claims**



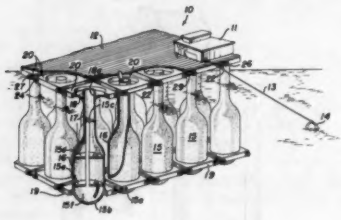
The invention comprises a device for automatically repositioning a machine if it comes to rest in an unwanted position, said device including a fluid power operated piston-cylinder unit adapted to give rotary motion to a machine shaft, a fluid pressure system including a control valve, a sensing unit on the shaft for controlling the valve, and means for bringing the sensing unit into operation when a braking action brings the machine to rest. The sensing unit is preferably electrical and the device is eminently applicable to sewing machines for positioning the needle.

3,592,154
HYDROPLANE CONSTRUCTION
Ronald Leslie Holmes, 30 Wilton Avenue, Southampton Hants, England
Filed Aug. 5, 1966, Ser. No. 570,606
Claims priority, application Great Britain, Aug. 6, 1965, 33,716/65
Int. Cl. B63b *35/00, 35/44*
U.S. Cl. 114—0.5 11 Claims



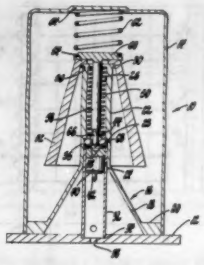
The invention relates to a waterborne craft of the hydroplane-type which is capable of ocean travel at high speed while simultaneously maintaining a high degree of stability and a horizontal aptitude to the craft. The craft is supported by a support assembly in the form of a plurality of vertical structure supports which have a pair of roller-shaped floats positioned to each vertical support through means of a rocker assembly pivotally connected to the vertical supports and mounted for reciprocating movement up and down the support, and shock absorbing means carried by said support to provide a shock absorbing action upon the vertical reciprocation of each pair of floats.

3,592,155
FLOATING PLATFORM
Edgar N. Rosenberg, 6914 Mission Gorge Road, San Diego, Calif.
Filed Apr. 24, 1969, Ser. No. 819,055
Int. Cl. B63b *35/00, 35/44*
U.S. Cl. 114—0.5 10 Claims



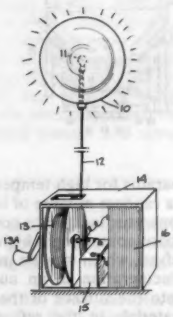
A flotation structure in the shape of an elongate bottle is cast in concrete as well as are sets of prestressed rods disposed at opposite ends of the structure. A plurality of such structures is joined together in sets by coupling devices provided at opposite ends of the prestressed rods to yield a highly stable floating platform since the center of buoyancy is well below surface wave turbulence. The necks of the bottle-shaped flotation structures have reduced cross-sectional area to minimize the possibility of an adverse reaction to surface wave action, e.g., rolling or heaving reactions within each flotation structure enables a selective shifting of ballasts to facilitate launching and alignment when several structures are joined together without requiring any elaborate support facilities. Sets of flotation structures are hinged together to form runways or include spaces vacant of flotation structures to form dry docks or reduced capacity platforms.

3,592,156
OMNIDIRECTIONAL SENSOR
Otakar P. Prachar, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 23, 1970, Ser. No. 31,086
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 8 Claims



An omnidirectional sensor includes a tubular guide slidably receiving an operator which is biased from a nonactuated position to an actuated position. The operator includes an axial bore opening to three radial bores, each of which receives a respective ball. A headed control rod projects within the axial bore and engages the balls to force the balls outwardly of the radial bores and into engagement with a radial shoulder of the guide to locate the operator in nonactuated position. A seismic mass seats on one end of the guide and engages the head of the control rod under a predetermined resilient bias. Movement of the mass under an acceleration pulse of predetermined amplitude and time overcomes the resilient bias and moves the control rod outwardly of the axial bore to permit the balls to move inwardly of the radial bores and out of engagement with the guide shoulder to release the operator. The sensor is reset by moving the operator against its bias from actuated position to nonactuated position so that the control rod projects within the axial bore and forces the balls outwardly of the radial bores into engagement with the guide shoulder.

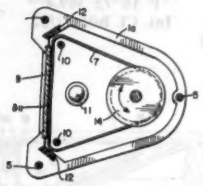
3,592,157
ILLUMINATED BALLOON
Robert C. Schwartz, 87-73 Kingston Place, Jamaica Estates, N.Y.
Filed Apr. 3, 1969, Ser. No. 813,244
Int. Cl. F21p *1/02*; F21l *15/08*
U.S. Cl. 116—124 B 6 Claims



An illuminated balloon adapted to function as a signal beacon or as a display device, the balloon being constituted by an inflatable bag of translucent material having a spout. Inserted in the spout to hermetically seal the bag is a stopper having a self-sealing plug portion to receive a hypodermic

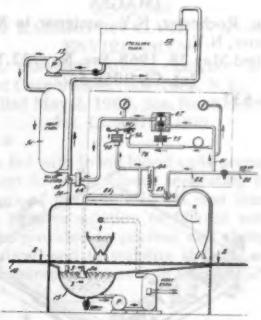
needle for injecting a lighter-than-air gas into the bag in order to inflate it to its full dimensions. Disposed within the bag at the end of a pair of stiff leads and connected thereto is an electrical light bulb, the leads extending through the stopper to external terminals. A battery serving as an anchor for the floating balloon is connected to the terminals by means of a flexible cable acting also to tether the balloon.

3,592,158
FRICTIONLESS READOUT INSTRUMENT
John Gear, Huntington, N.Y., assignor to Atlantic Scientific Corporation, Plainview, N.Y.
Filed Jan. 6, 1970, Ser. No. 981
Int. Cl. G09f 9/00
U.S. Cl. 116—129 6 Claims



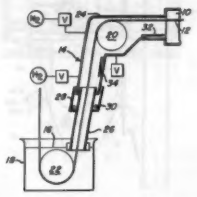
A frictionless readout device is disclosed in which guide means magnetically support a flexible magnetic tape for providing an indication corresponding to an input signal, characterized by extremely low power requirement and high precision. The strip is caused to move longitudinally across magnetic means generating a magnetic field of attractive power sufficient to cancel tension exerted longitudinally along the tape and thereby to suspend the tape in a fixed spatial relationship with the magnetic means.

3,592,159
LIQUID LEVEL CONTROL
Robert Murphy, Robinson, Ill., assignor to L. S. Heath & Sons, Inc., Robinson, Ill.
Filed Nov. 21, 1968, Ser. No. 777,563
Int. Cl. B05c 11/10
U.S. Cl. 118—7 4 Claims



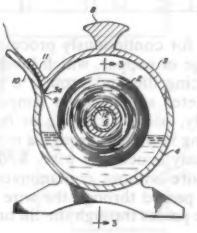
A level control for the chocolate supply in an enrober has a fast-cycling makeup controlled by an air tube applied to the surface of the chocolate so that slight lowering of the surface operates the makeup control.

3,592,160
RETRACTABLE SNOUT FOR METALLIC COATING PROCESS AND APPARATUS
Roman A. Schwieterman, and Kasimir Oganowski, both of Middletown, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio
Division of Ser. No. 859,033, Sept. 18, 1969.
Filed June 29, 1970, Ser. No. 50,476
Int. Cl. B05c 11/12
U.S. Cl. 118—65 12 Claims



Snout for metallic coating line extending from the strip preparation furnace to the coating metal bath, having a gas impermeable flexible joint permitting movement of the snout from a position with one end immersed in the coating bath to a position thereabove, permitting a change in coating metal bath or coating metal bath and container without degassing the strip preparation furnace.

3,592,161
CLEANING TISSUE DISPENSER
Erwin L. H. Hoffmann, Phoenix, Ariz., assignor to Modern Bidet Company
Filed Aug. 18, 1969, Ser. No. 850,929
Int. Cl. B05c 11/02
U.S. Cl. 118—122 1 Claim

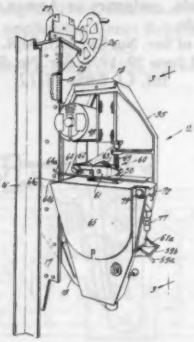


A device for dispensing lengths of wetted cleaning tissues from a container which may be either portable or built in. This invention provides a more convenient alternative to the so-called "bidet" of Europe and may be installed in bathrooms which could not accommodate a "bidet" without extensive reconstruction of the bathroom.

3,592,162
INSIDE-OUTSIDE GLUE LAP UNIT
Albert F. Shields, Forest Hills, N.Y., assignor to S & S Corrugated Paper Machinery Co., Inc., Brooklyn, N.Y.
Filed Dec. 15, 1969, Ser. No. 884,904
Int. Cl. B05c 11/08
U.S. Cl. 118—249 12 Claims

A gluing unit for inside and outside glue laps is constructed with a single glue wheel on a frame mounted for vertical movement to selectively position the glue wheel above and below a sheet feeding path. The frame is also pivotable 180° about a vertical axis, so that the peripheral portion of the glue wheel which engages the sheet material moves in the same direction as the sheet material regardless of whether

the glue wheel is applying glue to the upper or lower surface of the sheet. A single doctor means and a single glue nozzle,

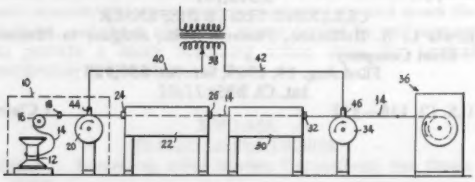


directing glue against the glue wheel periphery, are provided together with a single glue outlet in the movable frame.

3,592,163
APPARATUS FOR TREATING WIRE

Gordon L. Bauer, Shelton, Conn., assignor to Wyrepak Industries, Inc., Bridgeport, Conn.

Filed May 29, 1968, Ser. No. 733,093
Int. Cl. B05c *5/00, 3/02*
U.S. Cl. 118—620 **7 Claims**

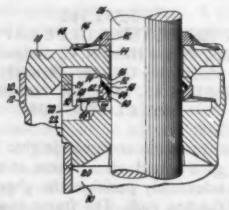


An apparatus for continuously processing wire containing a high percentage of copper, which involves pulling the wire through a reducing die and around a powered capstan to reduce its diameter and raise its temperature. The wire is then immediately, without cooling or bending or otherwise physically altering it, pulled through a molten tin bath to coat and simultaneously anneal the wire. Added heat may be imparted to the wire without contamination by means of an electric current passed through the wire via the pulling capstans as the wire passes through the tin bath.

3,592,164
SHOCK ABSORBER PISTON ROD SEAL ASSEMBLY WITH BELLEVILLE WASHER

Harold E. Schultze, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 1, 1969, Ser. No. 812,108
Int. Cl. F16f *9/36*
U.S. Cl. 188—322 **1 Claim**

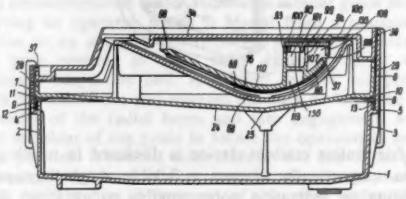


In preferred form, a direct acting hydraulic shock absorber having a frustoconically shaped piston rod seal biased by a Belleville washer spring against the outer surface of a piston rod to prevent hydraulic fluid leakage therebetween. The belleville washer spring is supported at its outer edge by a piston rod guide to cause its inner edge to bear against a loading ring having a conical end surface adjacent the conical end surface of the seal. The force of the loading ring on the seal radially biases the seal against the piston rod.

3,592,165
DEVELOPING DEVICE FOR PHOTOCONDUCTING MATERIALS

Karl Brendel, Rellingen/Holst; Georg Cranskens, Wedel/Holst; Hans Jakobson, Quickborn/Holst; Walter Limberger, Hamburg-Poppenbuttel; Egon Opravil, Hamburg-Pergedorf, and Werner Salger, Hamburg-Langenhorn, all of, Germany, assignors to Lumoprint Zindler KG, Hamburg, Germany

Filed Apr. 26, 1968, Ser. No. 724,360
Claims priority, application Germany, May 2, 1967
P 15 72 389.4
Int. Cl. B05c *3/02*
U.S. Cl. 118—428 **17 Claims**

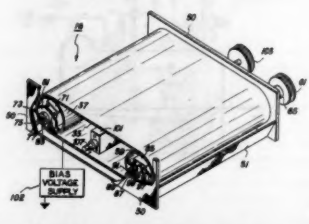


A developing apparatus for photoconductive materials, is formed of a storage tank for a supply of liquid developer with pigment particles. The developer liquid is pumped through a distributing channel and a calming chamber into an upwardly concave, shallow guide and the level of the developer liquid is determined by an overflow adjacent the outlet end of the guide from where it flows back into the storage tank. To provide nonturbulent supply, the developer flows from the distributing conduit into the guide below the level of liquid within the guide. The overflow or developer liquid outlet is formed by an edge of an upper guide element defining the guide channel. The components of the apparatus fit into one another for ease in assembly.

3,592,166
APPARATUS FOR DEVELOPING ELECTROSTATIC IMAGES

Paul S. L. Wu, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed May 28, 1968, Ser. No. 732,737
Int. Cl. B05b *5/02*
U.S. Cl. 118—637 **3 Claims**



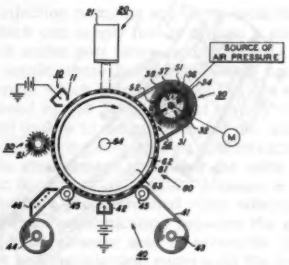
A developing apparatus for applying developing material to a photoconductive surface carrying a latent electrostatic image. The apparatus comprises a transport belt for trans-

porting a developer material made up of magnetic carrier particles and electroscopic toner powder in a path past the latent electrostatic image to be developed. Fixed magnets are disposed at the belt ends to provide magnets fields for handling the magnetic developer material. At the development zone, the developer material is not affected by the end magnets but instead by one or more rotatable magnet members disposed on the interior of the transport belt which rotate at a predetermined rate to cause a continuous rolling or cascading action of the developer material across the latent image during development. The belt may be electrically biased to suppress image fields in background areas.

3,592,167
APPARATUS FOR LOADING TONER ON A DEVELOPING BRUSH

James H. Blow, Jr., Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Apr. 2, 1969, Ser. No. 812,797
Int. Cl. G03g *13/06*
U.S. Cl. 118—637 **7 Claims**



A brush for developing electrostatic latent images having apertures which enable toner particles within the core of the brush to pass through the brush onto its outer periphery. The toner is held on the outer periphery of the brush by electrical charges until attracted to the latent image by electrostatic charges.

3,592,168
METHOD OF RAISING BIVALVES IN A CONTROLLED ENVIRONMENT

George Claus, Stamford, Conn., assignor to Offshore/Sea Development Corporation, New York, N.Y.

Filed May 2, 1969, Ser. No. 821,456
Int. Cl. A01k *61/00*
U.S. Cl. 119—4 **11 Claims**

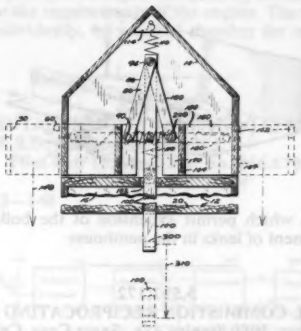
Bivalves are fed with living blood cells prepared by adding an anticoagulant to whole blood, separating the blood cells from the plasma of the whole blood, and then washing the blood cells in a saline solution or filtered sea water. Additional steps are provided to prevent cell clumping and bacterial proliferation, and to stabilize the cell membrane and facilitate the dispersal of the cells in liquid.

3,592,169
SELF-CLEANING BIRDHOUSE

Thomas D. Killmon, Rte. 1, Council Bluffs, Iowa

Filed Sept. 15, 1969, Ser. No. 857,893
Int. Cl. A01k *31/00*
U.S. Cl. 119—23 **4 Claims**

A birdhouse having a roof and a floor and having a nesting area, front wall and rear wall, which are connected together so that they can be moved outwardly beyond the floor to allow old nesting material to fall down from the birdhouse,

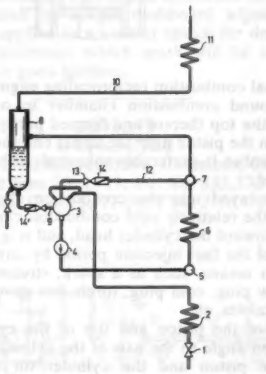


and means for moving the front and rearward walls inwardly and outwardly as controllable from the ground.

3,592,170
APPARATUS AND METHOD FOR RECIRCULATING WORKING MEDIUM IN A FORCED FLOW STEAM GENERATOR

Ewald K. Burkle, Stuttgart, Germany, assignor to Sulzer Brothers, Limited, Winterthur, Switzerland

Filed July 24, 1969, Ser. No. 844,576
Claims priority, application Germany, July 25, 1968
P 17 51 761.2
Int. Cl. F22b *20/06*
U.S. Cl. 122—406-S **1 Claim**



At least some of the working medium leaving the evaporator is condensed on at least some of the preheated feed water and is fed with the feed water to the evaporator inlet. The temperature of the condensate and feed water mixture is kept 10° to 20° C. below the saturated steam temperature. The condensate can be formed in a separable mixer or in a water separator.

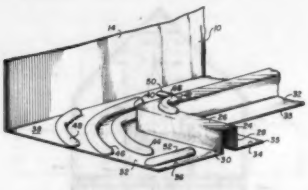
3,592,171
BOILER PENTHOUSE

Martin D. Bernstein, Bronx, N.Y., assignor to Foster Wheeler Corporation, Livingston, N.J.

Filed Aug. 28, 1969, Ser. No. 853,903
Int. Cl. F22b *37/36*
U.S. Cl. 122—494 **5 Claims**

A pressurized penthouse which is joined to the top of a boiler and which retains internal pressure even when the

boiler expands substantially more than the penthouse. The overhang of the penthouse is provided at each corner with



corrugations which permit expansion of the boiler without the development of leaks in the penthouse.

3,592,172

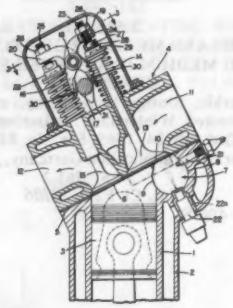
INTERNAL COMBUSTION RECIPROCATING ENGINE

Otis D. Treiber, 3080 Stanley Ave., Santa Cruz, Calif.

Filed Jan. 28, 1969, Ser. No. 794,555

Int. Cl. F02b *19/16*

U.S. Cl. 123—30 D **8 Claims**



An internal combustion reciprocating engine having a substantially round combustion chamber in one side of the cylinder at the top thereof and formed partly in the cylinder and partly in the piston near the upper end thereof. The combustion chamber is preferably spherical, although it may be drum shaped.

Fuel is sprayed into the combustion chamber, directed away from the relatively cool combustion chamber walls and preferably toward the cylinder head, and is ignited during the early part of the fuel injection period by any of many artificial ignition means, such as a spark, stream of sparks, hot sparks, glow plug, cold plug, torch, hot spot or pin, various kinds of catalysts, etc.

The top of the piston and top of the cylinder are both located at an angle to the axis of the cylinder, with the long side of the piston and the cylinder on the combustion chamber side.

Movement of the piston produces high turbulence of the combustion air equivalent to 1 ½ to 5 revolutions of eddying of the air past the fuel spray nozzle during the maximum duration of fuel injection.

3,592,173

MULTICYLINDER INTERNAL COMBUSTION ENGINE

Dieter Frehe, Macon, France, assignor to Walter Gutbrod and Wolfgang Gutbrod, Gutbrod-Werke GmbH, Bubingen/Saar, Bubingerhof, Germany

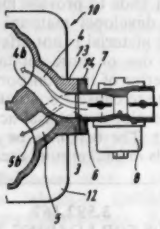
Filed July 7, 1969, Ser. No. 839,433

Claims priority, application Germany, July 22, 1968, P 17 51 746.3

Int. Cl. F02b *75/18, 33/04, 75/20*

U.S. Cl. 123—52 M **6 Claims**

An internal combustion engine having two or more cylinders vertically disposed, one relative to the other or others, the fuel for the vertically disposed cylinders being supplied through a single main induction pipe, the conduit being in fluid communication with a horizontally divided cylinder induction conduit, a portion of the divided cylinder induction



conduit being utilized for each of the plurality of cylinders for feeding fuel mixture thereto.

3,592,174

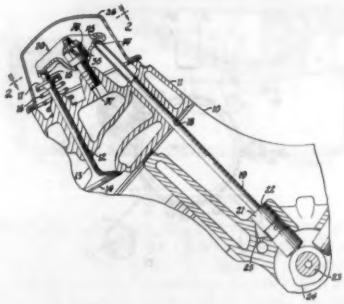
VALVE ROCKER ARM

Walter C. Heidacker, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 3, 1970, Ser. No. 16,028

Int. Cl. F01m *9/10;* **F01l** *1/18*

U.S. Cl. 123—90.35 **3 Claims**



A valve rocker arm for transmitting reciprocatory movements between a poppet valve and its push rod, the rocker having surfaces on one side adjacent its opposite ends adapted to engage the driving and driven ends of the push rod and valve, respectively, an oppositely presenting pivotal bearing surface for the rocker on its opposite side intermediate the ends thereof and adapted to journal on a cooperating seat, the rocker arm being provided with an integral oil deflector at one end thereof in the form of a tab bent back over an oil hole extending through the surface seat for the push rod to catch oil delivered from the push rod and deflect it inwardly toward the pivotal bearing surface to lubricate the ball seat on which the rocker arm is pivotally mounted.

3,592,175

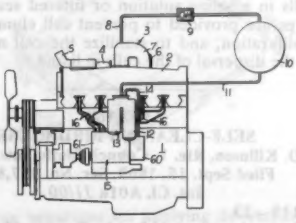
PRESSURIZED FUEL SYSTEM

William I. Hamilton, Chicago Heights, Ill., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 6, 1968, Ser. No. 781,751

Int. Cl. F02d *23/02*

U.S. Cl. 123—136 **7 Claims**



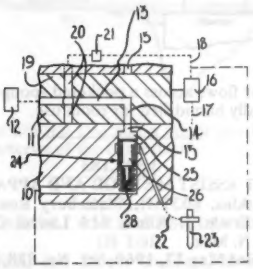
A fuel system pressurized by an engine supercharger.

3,592,176

LIQUID FUEL PUMPING APPARATUS

Ivor Fenne, Greenford, England, assignor to C. A. V. Limited, London, England

Filed June 16, 1969, Ser. No. 833,606
Claims priority, application Great Britain, July 1, 1968, 31261/68
Int. Cl. F02m 63/00
U.S. Cl. 123—139 2 Claims



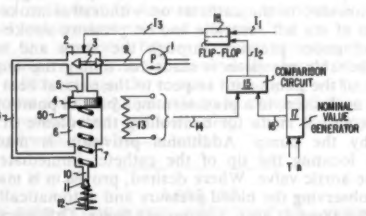
A liquid fuel injection pumping apparatus including an injection pump which can supply fuel in turn to a plurality of outlet ports, each outlet port being connected by a pipeline to an injection nozzle, there being disposed in each outlet port a valve element which is spring loaded in one direction and which is moved by the action of fuel leaving the outlet port, to allow fuel to flow to the pipeline and the remote side of the valve element being subjected to a substantially constant pressure the arrangement being that the valve element will remain in the open position until the pressure in the outlet port has fallen to a predetermined value whereafter the element cuts off the communication between the pipe line and the port and the element acts to pressurize fuel contained in the port and the injection pump until the communication between the injection pump and the port is closed.

3,592,177

FUEL-INJECTION APPARATUS FOR INTERNAL-COMBUSTION ENGINES

Heinz Wehde, Heidelberg, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Filed Oct. 6, 1969, Ser. No. 863,945
Claims priority, application Germany, Oct. 4, 1968, P 18 01 156.8
Int. Cl. F02m 51/00
U.S. Cl. 123—139 E 13 Claims



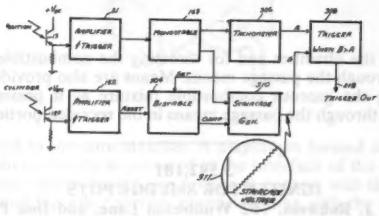
Fuel-injection apparatus for use with internal-combustion engines having an intermediate reservoir which stores and makes available the quantity of fuel to be injected for each fuel-injection operation. The intermediate reservoir is provided with two chambers separated from each other by a movable dividing wall. The first of these chambers is connected between a pressurized fuel supply and/or the second of these chambers. The second chamber is selectively connected between the first chamber and at least one fuel-injection nozzle. A spring is arranged in the second chamber to bias the movable wall in the direction of enlargement of the second chamber. The first chamber may be selectively connected by one three-way valve or by two one-way valves. Means are provided to adjust the quantity of fuel injected in response to the requirements of the engine. The devices may be used individually, or grouped together for multicylinder engines.

3,592,178

ELECTRONIC IGNITION TIMING CIRCUIT

Peter Schiff, R.D. #2, Lambertville, N.J.

Filed Oct. 15, 1969, Ser. No. 866,670
Int. Cl. F02p 1/00, 5/04
U.S. Cl. 123—148 11 Claims



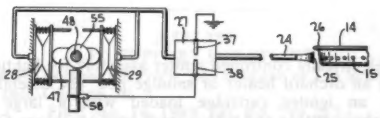
A solid-state electronic timing circuit for adjusting the initial idling timing, the rate of advance of timing with increasing engine r.p.m. and the maximum advance by means of readily accessible manual adjusting means to obtain peak engine performance, which system is used in place of conventional timing means such as ignition points. The system is controlled by position markers and cylinder reference markers generated by the rotation of the distributor shaft. These signals are electronically manipulated to produce accurate ignition timing pulses. Electronically, the initial timing, rate of advance with increasing r.p.m., and maximum advance is accurately controlled by simple dashboard adjustment. The output pulse is applied to a control circuit for delivering the spark to the distributor, which spark will be of sufficient energy to provide good ignition.

3,592,179

GAS IGNITER

Linus K. Hahn, 1920 Hillside Drive, Columbus, Ohio

Filed June 23, 1969, Ser. No. 835,373
Int. Cl. F23q 21/00; F24c 3/10
U.S. Cl. 126—41 16 Claims



Disclosed is a gas igniter for gas heated grills wherein gas is sucked from the grill into an ignition chamber by increasing the volume of a contractable chamber. The ignited gas is blown out of the chamber by decreasing the volume of the contractable chamber.

3,592,180

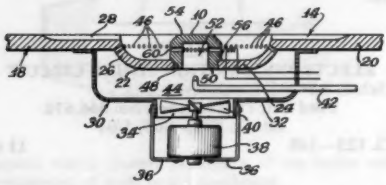
GAS BURNER DEVICE

Esher R. Kweller, Downers Grove; Robert B. Rosenberg, Evergreen Park, and William R. Staats, Chicago, all of, Ill., assignors to Instituute of Gas Technology

Filed May 5, 1969, Ser. No. 821,872
Int. Cl. F24c 3/00, 15/10
U.S. Cl. 126—39 7 Claims

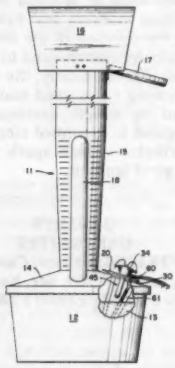
A gas burner for heating a pot or pan for use on a gas range top. The burner includes a planar portion and a recessed portion which is unitary with the planar portion. A

chamber is provided below the recessed portion and passage means extend from the chamber and pass outwardly through the recessed portion. Means are provided for introducing a gaseous combustible medium, such as a mixture of air and



gas, to the chamber and for directing the combustible mixture through the passage means. Means are also provided for igniting the gaseous combustible mixture as it passes outwardly through the passage means in the recessed portion.

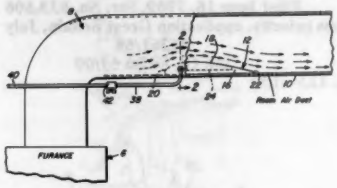
3,592,181
IGNITER FOR SMUDGE POTS
Gerald J. Rohwein, 752 Wimbleton Lane, and Don P. Van Dyke, 1125 Lakehurst Road, both of Livermore, Calif.
Filed Dec. 29, 1969, Ser. No. 888,460
Int. Cl. A01g *13/06*
U.S. Cl. 126—59.5 **10 Claims**



An electrically controlled igniter assembly for lighting the fuel in an orchard heater or smudge pot. The assembly includes an igniter cartridge loaded with a large main pyrotechnic charge and with a small ignition charge fired by an electric heating element to ignite the main pyrotechnic charge. The assembly further includes a cartridge holder comprising an open ended tube adapted to be secured to a smudge pot and project into the fuel chamber thereof, and a connector for electrically connecting an igniter cartridge inserted into the holder tube to an emergizing and control circuit by means of which the heating element of the cartridge is energized.

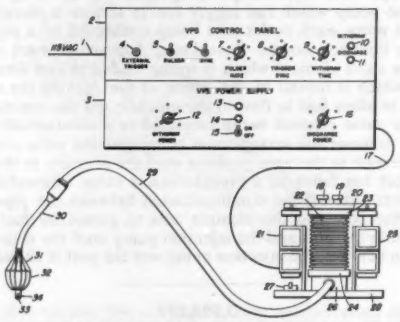
3,592,182
HUMIDIFIER
Richardson, Benjamin F., Hebron, Ky., assignor to Aeropro Enterprises, Inc., Cincinnati, Ohio
Filed July 22, 1969, Ser. No. 843,363
Int. Cl. F24f *3/14*
U.S. Cl. 126—113 **5 Claims**

An airfoil-type humidifier for installation within the confines of a horizontal furnace duct. No electricity is needed. A hollow shell provides a water trapping container. The water level is controlled by a float valve. The airstream from the



furnace blower flows across a pocketed sponge, is moistened, and is effectually humidified for room use.

3,592,183
HEART ASSIST METHOD AND APPARATUS
David H. Watkins, 6039 N. Waterbury Road, Des Moines, Iowa, and Erwin J. Klink, 814 Laurel Circle S.E., Albuquerque, N. Mex.
Filed May 27, 1969, Ser. No. 828,151
Int. Cl. A61b *19/00;* **A61m** *1/03*
U.S. Cl. 128—1 R **11 Claims**

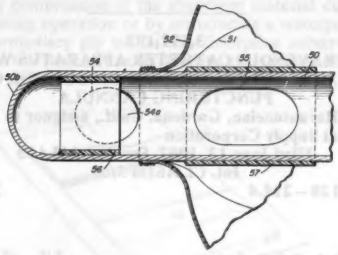


Method and apparatus for assisting a failing heart by sucking blood out of the left ventricle during normal systolic action, while at the same time blocking flow to the aorta, and during diastolic action, when the aortic valve is closed, forcing blood into the aorta and thence to the arterial tree. More particularly, there is provided a catheter with openings back from the tip thereof and with a radially surrounding collapsible portion, which catheter is inserted in the aorta with tip immediately above the aortic valve. A reciprocating external pump connected to the catheter on withdrawal stroke sucks blood out of the left ventricle and on pressure stroke forces the blood under pressure through the aorta and arterial system. Suitable provision is made for timing the sequence and pace of the pump with respect to the natural beat of the heart or, as desired, to a predetermined beat in point of time. Provision also is made for controlling the volume of blood moved by the pump. Additional provision is made for precisely locating the tip of the catheter immediately adjacent the aortic valve. Where desired, provision is made for directly observing the blood pressure and automatically controlling the same at a predetermined figure. Other provision is made for supplying additional blood.

3,592,184
HEART ASSIST METHOD AND CATHETER
David H. Watkins, 6039 N. Waterbury Road, Des Moines, Iowa, and Erwin J. Klink, 814 Laurel Circle S.E., Albuquerque, N. Mex.
Filed Dec. 16, 1969, Ser. No. 885,507
Int. Cl. A61m *1/03;* **A61b** *19/00*
U.S. Cl. 128—1 R **5 Claims**

Method and device for augmenting the action of an ailing heart having an incompetent aortic valve, wherein blood is

sucked up from the aorta, while blocking flow to the arterial tree, and then, upon reverse, a major portion of the blood is



forced into the arterial tree and a minor portion forced into the coronary arteries of the heart itself.

3,592,185

FERROMAGNETIC CONTRAST MEDIA AND METHOD OF USE

Ephraim H. Frei, and Efrom Gunders, both of Rehovoth, Israel, assignors to Yeda Research and Development Co., Ltd., Rehovoth, Israel

Filed Apr. 18, 1967, Ser. No. 631,597
Int. Cl. A61k *27/08*
U.S. Cl. 128—2 **4 Claims**

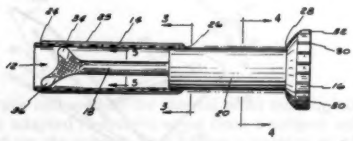
Ferromagnetic contrast media incorporating magnetic ferrites such as magnesium ferrite, barium ferrite, manganese ferrite, manganese-zinc ferrite, nickel ferrite, magnetite, or ferromagnetic garnets; γ-ferric oxide and a guar gum stabilizer. Such media are used for diagnostic or therapeutic treatments of the gastrointestinal or lymph tracts, by subjecting the patient to external magnetic fields to concentrate the medium in the body region to be diagnosed or treated.

3,592,186

CYTOLOGIC SCRAPER

Claude Oster, 16206 Addison, Southfield, Mich.

Filed Jan. 28, 1969, Ser. No. 794,520
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 R **1 Claim**



An apparatus adapted to be self-administered for obtaining surface cells from a human being, particularly from the vaginal and cervical areas of a female, for use in diagnosing cancer, the apparatus having a spatulalike scraper of heartlike configuration with two dissimilarly shaped lobes for taking a cellular smear, the scraper telescoping within a protective cover and being operable to be extended therefrom and to be rotated for cell collecting when the apparatus is disposed within the human body.

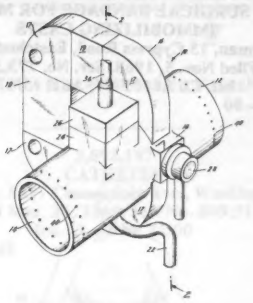
3,592,187

BLOOD FLOW RATE - PRESSURE TRANSDUCER

Myron Youdin, Flushing, and Theobald Reich, New York, both of, N.Y., assignors to New York University, New York, N.Y.

Filed Sept. 3, 1969, Ser. No. 854,989
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 E **5 Claims**

A blood flow and blood pressure transducer is provided including a core member having a fixed orifice lumen therethrough adapted to be coupled in line or about a blood vessel. Permanent magnets are coupled to the core forming a magnetic circuit, the force lines of which are perpendicular to the axis of the lumen. Two housings containing silver-silver chloride electrodes covered with permeable membranes are rigidly fastened to opposite sides of the core so that their electrodes extend into a gap in the magnetic circuit. The electrodes are aligned perpendicular to both the longitudinal axis of the lumen and the magnetic force lines. A third housing containing a silicon wafer strain gage is also



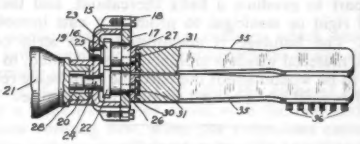
coupled to the core member. A diaphragm formed of a very thin sheet of mica is provided at the interface of the housing and core lumen having one surface in contact with the strain gage and the other surface communicating with the core lumen.

3,592,188

POWER OPERATED GUM MASSAGER AND TOOTH BRUSH

Forest H. Barnett, 2602 N. Baltimore, Tacoma, Wash.

Filed Mar. 21, 1969, Ser. No. 809,303
Int. Cl. A61h *7/00*
U.S. Cl. 128—62 A **3 Claims**



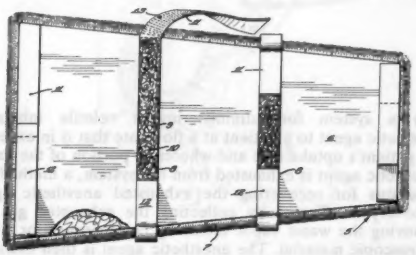
Two brush members, each having a set of bristles are supported from a housing and driven by gear and crank means so as to move the two sets of bristles in opposite directions along two generally oval paths. This provides a brush in which the sets of bristles, when in use for massaging the gums, will always move outwardly over the gums toward the crowns of the teeth thus avoiding brushing the gums back on the teeth, which might tend to cause them to recede.

3,592,189

LEG SUPPORT FOR SPLINT

Donald W. Bergen, Glenview, Ill., assignor to The Scholl Mfg. Co. Inc., Chicago, Ill.

Filed Feb. 14, 1969, Ser. No. 799,253
Int. Cl. A61f *5/04*
U.S. Cl. 128—89 R **3 Claims**



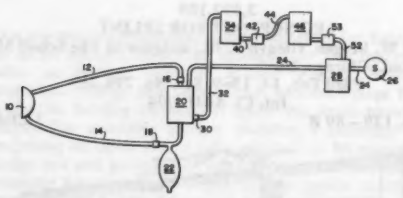
A leg support for use with a splint of the type used for fracture of a leg bone when traction is indicated. The support is

readily attached to or removed from the splint and shaped to cradle the leg and provides soft cushioning support and protection to pressure-sensitive areas, and may be sterilized and reused indefinitely.

3,592,190
NEOPRENE SURGICAL BANDAGE FOR MAKING BODY IMMOBILIZING CASTS
Jack J. Silverman, 15 Cypress Road, Eastchester, N.Y.
Filed Nov. 5, 1968, Ser. No. 773,396
Int. Cl. A61f 5/04; A61l 15/07
U.S. Cl. 128—90 **1 Claim**

A surgical dressing in the form of a plastic, foraminated bandage which may be wound about a diseased, deformed or broken part to produce a helix thereabout, and thereafter rendered rigid or semirigid to produce a cast immobilizing the part. The bandage is constituted by a strip of thermoplastic material which is moldable, when heated, to permit the strip to be wound about the part, the strip being rendered semirigid or rigid when cooled to room temperature.

3,592,191
RECOVERY OF ANESTHETIC AGENTS
Richard R. Jackson, 8 Trinity Road, Marblehead, Mass.
Filed Jan. 17, 1969, Ser. No. 791,910
Int. Cl. A61m 17/00; B01d 51/10
U.S. Cl. 128—188 **29 Claims**

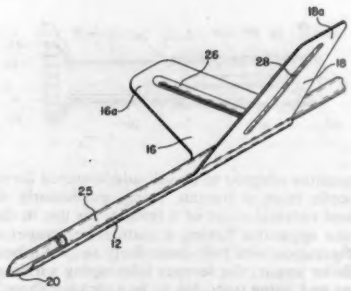


In a system for administering a volatile inhalation anesthetic agent to a patient at a flow rate that is in excess of the patient's uptake rate and wherein a portion of the excess anesthetic agent is exhausted from the system, a method and apparatus for recovering the exhausted anesthetic agent. Recovery is effected by collecting the exhausted gas and removing the water vapor either by condensation or with a hygroscopic material. The anesthetic agent is then extracted from the dried gas by a cryogenic process in which the vapors in the anesthetic agent are condensed to a liquid phase or by an absorbent material which is processed later to remove the agent. When employing the condensing process, the anesthetic condensate is collected and may be readmitted directly into the anesthetic system.

3,592,192
INTRAVENOUS CATHETER APPARATUS WITH CATHETER TELESCOPED ON OUTSIDE OF PUNCTURING CANNULA
Andrew Harautunelan, Gardena, Calif., assignor to American Hospital Supply Corporation
Filed June 13, 1967, Ser. No. 645,655
Int. Cl. A61m 5/00
U.S. Cl. 128—214.4 **24 Claims**

An intravenous catheter assembly in which a separable gripping hub integrates a rigid cannula and flexible catheter for retaining them against relative movement during a venipuncture and permitting relative longitudinal movement after the flexible catheter has been in place and the cannula is to be withdrawn; the gripping hub including hinged jaws and a circumferential pressure band; a base plate and separate clamp parts; and a transverse clamp plate; the latter gripping heads including means for gripping a flexible protective sheath; the cannula being connected at its rear end to a flexible, withdrawing wire, and a protective rigid housing into which the cannula is withdrawable while the flexible sleeve protects against contamination of blood etc.

3,592,193
REMOVABLE GUIDE NEEDLE
James A. Higgins, Racine, Wis., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Apr. 10, 1969, Ser. No. 814,977
Int. Cl. A61m 5/00
U.S. Cl. 128—214.4 **5 Claims**

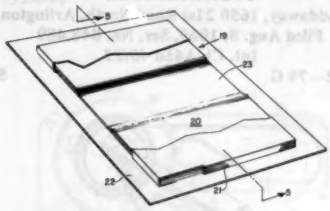


A removable guide needle is provided for use with a flexible catheter tube in withdrawing or introducing fluids relative to a body, the guide needle having handle means associated therewith which provides controlled insertion and removal from the body with subsequent detachment from the flexible catheter tube in an expeditious manner.

3,592,194
DIAPER HAVING IMPROVED WICKING AND DRYNESS
Robert C. Duncan, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 5, 1969, Ser. No. 804,560
Int. Cl. A61f 13/16
U.S. Cl. 128—287 **16 Claims**

A diaper is disclosed wherein the structure comprises an absorptive substrate wherein the amount of expressible

moisture within the central section of the substrate is reduced relative to contiguous peripheral sections either by reduction in weight of absorbent material per unit of surface area or by compression of the absorbent material during the manufacturing operation or by introducing a waterproof film as an intermediary ply within the absorptive substrate. The purpose of the structure is to improve the surface dryness of

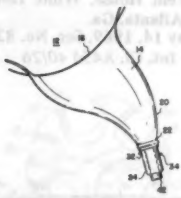


the central section of the diaper topsheet surface and improved utilization of absorptive substrate materials toward the diaper extremities. Also disclosed is a diaper structure wherein the relation between free space available for fluid retention of the topsheet and in-use changes of absorptive capacity of the substrate's central section are specified so as to preclude or minimize surface flooding of the diaper topsheet, which is adjacent the wearer's skin.

3,592,195
MEANS AND METHOD FOR DIURNAL TOILET TRAINING

Richard K. Van Wagenen, 3304 S. Stanley Place, Tempe, Ariz.; Russell W. Meredith, 405 E. 10th St., Mesa, Ariz., and Lee Meyerson, 6816 Almeria, Scottsdale, Ariz.

Filed July 22, 1968, Ser. No. 746,640
Int. Cl. A61f *5/44*
U.S. Cl. 128—295 **2 Claims**



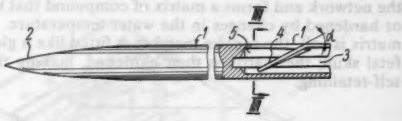
A means and method for diurnal toilet training comprising a nozzle adapted to receive urine from a subject; said nozzle mounted on the subject, and having a passage in which two spaced electrodes are so disposed that urine provides an electrical bridge only when flowing through the passage; and an audio signal device coupled to the electrodes and carried by the subject; said warning device carried by the subject adapted to sound an audio signal when urination starts so as to alert the subject and a trainer in order to elicit restraint of the voiding impulse and to move to a proper toilet area, remove clothing, and take an appropriate stance for the voiding event.

3,592,196
SURGICAL NEEDLE WITH SUTURE RETAINING MEANS

Boris Yakovlevich Dalkhovsky, Karetny ryad, 5/10, kv.12, and Sergei Petrovich Kosov, pereulok Raskovoi, 19/23, kv.61, both of Moscow, U.S.S.R.

Continuation of application Ser. No. 633,482, Apr. 25, 1967, now abandoned. This application Nov. 28, 1969, Ser. No. 876,192
Int. Cl. A61b *17/06*
U.S. Cl. 128—339 **4 Claims**

A surgeon's needle has a rear portion in the shape of a tube which opens to the rear, a longitudinal slot being formed in said rear portion equal to the thickness of the suture material, the slot dividing the rear portion into two resilient sections. A resilient tongue is stamped from one of the sections and the end of the tongue is in the direction of

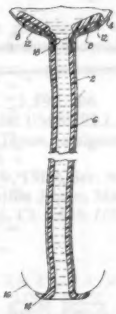


the needle point, the tongue extending through the longitudinal slot.

3,592,197
CATHETER

Milton J. Cohen, 5437 Connecticut Ave., Washington, D.C.

Filed Mar. 24, 1969, Ser. No. 809,918
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 **1 Claim**

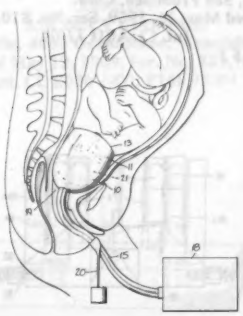


This application discloses a catheter which comprises a hollow tube having a plurality of extensions at one end which are normally urged, by springs or other force exerting means, outwardly of the tube so that after the catheter has passed through a body passage or canal, with the end carrying the extensions entering first, when the extensions enter a body cavity the extensions will bend outwardly engaging the walls of the cavity adjacent the passage to retain the catheter therein so that fluid may be drained from the cavity.

3,592,198
OBSTETRICAL INSTRUMENT FOR FETUS EXTRACTION

Evan F. Evans, 3755 Washington Blvd., Ogden, Utah

Filed Oct. 31, 1967, Ser. No. 679,442
Int. Cl. A61b *17/42*
U.S. Cl. 128—352 **8 Claims**



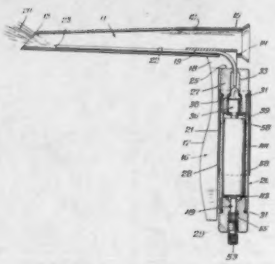
A surgical instrument, such as an obstetrical forceps has a flexible member made of vinyl plastic sheets. The member has closed wall portions that form a caplike shape. A capilla-

ry network inside the walls of the member is connected through a flexible tube to a source of temperature-controlled circulating water. A thermosensitive compound surrounds the network and forms a matrix of compound that is softened or hardened by changes in the water temperature. While the matrix is soft, the caplike member is fitted like a glove on the fetal skull; the matrix is then hardened, making the forceps self-retaining.

3,592,199
AUTOCLAVABLE SURGICAL INSTRUMENT ILLUMINATION

Ralph G. Ostensen, Morton Grove, Ill., assignor to Medical Productz Corp, Skokie, Ill.

Continuation of application Ser. No. 574,431, Aug. 23, 1966, now abandoned. This application Feb. 9, 1970, Ser. No. 9,105
Int. Cl. A61b *1/06*
U.S. Cl. 128—6 **10 Claims**

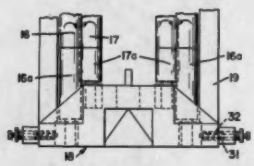


An autoclavable surgical instrument for directly illuminating interior portions of a human body having a distal end for insertion into a body cavity and a proximal end including a handle portion, a fiber optics device extending from a point adjacent the distal end to a proximal end adjacent the handle portion, and a powerpack unit including a light source, and means removably mounting that unit on the handle portion to position the light source in cooperative relationship with the proximal end of the fiber optics device; lens means being interposed between the light source and the fiber optics device, and means for mounting the lens means on the handle portion to cooperate with the power pack unit to properly position the latter relative to the fiber optics device.

3,592,200
CORN HUSKING MACHINE

Floyd O. Fedderly, Toppenish, Wash., assignor to Del Monte Corporation, San Francisco, Calif.

Filed Mar. 26, 1969, Ser. No. 810,756
Int. Cl. A01f *11/06*
U.S. Cl. 130—5 J **3 Claims**

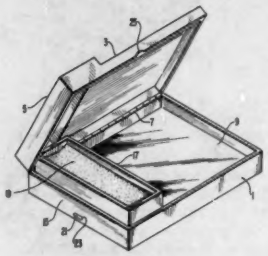


A corn husking machine having one or more sets of oppositely rotating husking rolls. The ears are caused to move along the rolls while the husks are being removed. One roll is made longer than the other at the discharge end of the machine whereby plugging or jamming is eliminated or greatly minimized.

3,592,201
COSMETIC CASE

Klein K. Haddaway, 1650 21st Road North, Arlington, Va.

Filed Aug. 8, 1069, Ser. No. 848,489
Int. Cl. A45d *40/22*
U.S. Cl. 132—79 G **5 Claims**



A mirrored cosmetic case has a snap-in container for a solid cosmetic at one end of the mirror and a hinged lid that is recessed to accommodate the container.

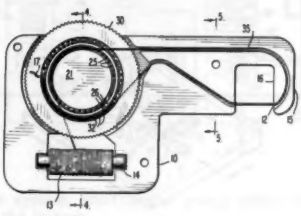
3,592,202
TOILETRY ARTICLE

Frances F. Jones, Pent House, White House Motor Inn 70 Houston St. N.E., Atlanta, Ga.

Filed May 14, 1969, Ser. No. 826,084
Int. Cl. A45d *40/26*
U.S. Cl. 132—88.7 **3 Claims**

The present invention is a fingernail polish kit or toiletry article having a rigid, central, handle-forming body or sleeve or appropriate length to contain within the same lint cotton, gauze, or other appropriate preferably absorbent substance used in manicuring. In each end of the sleeve is frictionally and removably telescoped a tube container either having a readily distortable wall portion or the entire tube flexible with a stopper or plug at its open end, one of the containers being adapted to receive fingernail polish remover and the other, fingernail polish. Each stopper is provided with an axial channel or passage in the outer end of which is a removable and replaceable brush so that when the container is squeezed it will expel a drop of the liquid for application by the brush to a fingernail, a removable and replaceable protective cap or cover being provided for each brush with one cover of a different detectable characteristic from the other to enable the device to be used regardless of whether in the light or not. Also a holder is provided in the form of a base which may be a suction cup and an upwardly opening yoke for receiving the body of the device so that when on a flat surface it will not roll, and alternately the device may be attached to a surface either horizontal or otherwise.

3,592,203
DENTAL FLOSS DISPENSER
Bradford J. Johnson, 4718 68th Ave., Landover Hills, Md.
Continuation-in-part of application Ser. No. 744,278, June 10, 1968, now abandoned. This application Dec. 29, 1969, Ser. No. 888,475
Int. Cl. A61c *15/00*
U.S. Cl. 132—91 10 Claims



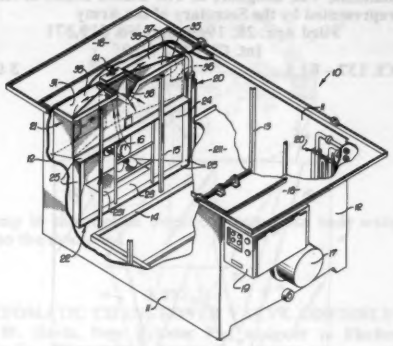
This invention relates to improvements in a device for dispensing dental floss from a source of supply such as a spool by a clutch member which cooperates with a drive means for unwinding and feeding the floss to an exposed position exteriorly of the housing preparatory for use, the clutch member holding the floss taut while in use.

3,592,204
CHANGE HOLDER
Robert Hernandez, 2025 N. Western Circle, Camarillo, Calif.
Filed Sept. 24, 1968, Ser. No. 761,906
Int. Cl. G07d *1/00*
U.S. Cl. 133—6 1 Claim

A change holder to be carried in the pocket or purse which is designed to carry a plurality of coins ranging from one cent to fifty cent pieces. The change holder is formed primarily of two pieces of molded plastic material and has a round shape with the coins carried in compartments inside the circumference of the holder. The coins are retained in these compartments by an elliptical base member and resilient pins which partially block the coin slot entrances.

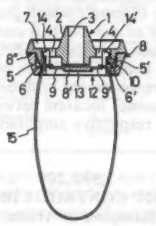
3,592,205
WASHING APPARATUS WITH SLUDGE SEPARATOR
Richard H. Sheppard, Palos Verdes Penninsula, Calif., assignor to Purex Corporation, Ltd., Lakewood, Calif.
Filed Sept. 29, 1969, Ser. No. 861,577
Int. Cl. B08b *3/10, 15/00*
U.S. Cl. 134—104 14 Claims

Apparatus for the cleaning of mechanical or structural parts by circulation of cleaning solution within a tank having cavitated end walls which house circulating propellers and wherein sludge is entrapped in one or a pair of relatively small volume containers receiving side streams of propeller-displaced cleaning solution, these containers being manually removable from the tank without interruption of the parts cleaning operation. The invention also provides improvements in the tank and propeller housing constructions and



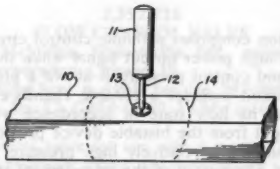
benefits resulting from association within the tank of the propeller housing with vertical end walls of the tank.

3,592,206
KNOBS FOR UMBRELLA STICKS
Satuki Kitani, Tokyo, Japan, assignor to Okuda Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 10, 1969, Ser. No. 865,360
Claims priority, application Japan, Mar. 11, 1969, 44/22096
Int. Cl. A45b *1/00*
U.S. Cl. 135—46 5 Claims



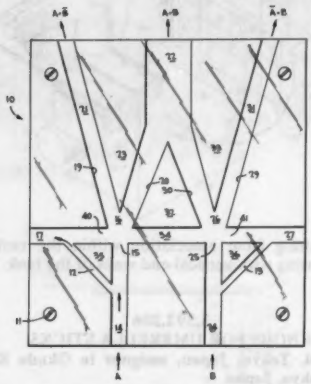
A knob for an umbrella stick comprises an adapter having an opening for accommodating the stick and a pair of opposing shoulders, an intermediate member having spaced-apart windows and a recess to accommodate the bottom portion of the adapter, and a locking member having a pair of spaced-apart hooks which are inserted through the windows to engage the shoulders thus maintaining the knob in the assembled state.

3,592,207
AIR DUCT CLOSURE
Richard A. Borello, 4060 Grant Road, Mountain View, Calif.
Filed May 12, 1969, Ser. No. 823,707
Int. Cl. E03b *1/00*; F16k *13/04*
U.S. Cl. 137—1 5 Claims



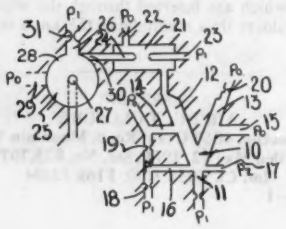
A closure for a ventilating or heating duct comprises a plug or pillow of a foamed plastic automatically injected into the duct by a propellant, through a temperature sensitive valve which opens at a predetermined temperature as in case of fire.

3,592,208
FLUERIC SELF-BIASING AND GATE
Henry Steven Kimmel, Greenbelt, Md., and Elmer L. Swartz, Annandale, Va., assignors to The United States of America as represented by the Secretary of the Army
Filed Apr. 28, 1969, Ser. No. 819,871
Int. Cl. F15c 1/10
U.S. Cl. 137—81.5 3 Claims



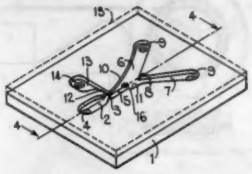
A flueric AND logic element is disclosed which is capable of accurate and reliable operation without the necessity of critical dimensional control. This is accomplished by the use of a pair of fluid bias channels which produce a low pressure region in the vicinity of the control nozzle. In one embodiment the bias channels are located between the two input signals and the two control channels of the respective amplifiers. In a second embodiment both bias channels feed into a central control channel located between the two interaction chambers of the respective amplifiers.

3,592,209
FLUIDIC CONTROL CIRCUITS
Michael John Joby, Hampton-in-Arden, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed May 26, 1969, Ser. No. 828,458
Int. Cl. F15c 1/12, 1/16
U.S. Cl. 137—81.5 13 Claims



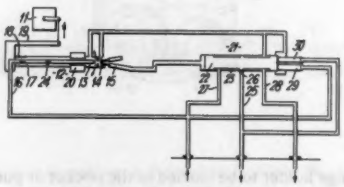
The invention comprises a fluidic control circuit adapted to produce a high power output signal when the ratio of a first and second control pressure is above a predetermined value. The circuit includes a bistable coanda-effect device which changes its flow state in accordance with the said ratio. An output from the bistable device provides the control for modulating a relatively high pressure in an intermediate stage. The output of the intermediate stage forms a control for a final stage in which flow of fluid from a nozzle to an outlet is interrupted by causing swirling about the axis of the nozzle. Accurate sensing of pressure differentials by the bistable device is thus combined with the high power amplification of the output stage.

3,592,210
FLUID-OPERATED DEVICES
Brian John Steptoe, Hitchin; Sidney Ties, Stevenage, and William Cecil Morton, Biggleswade, all of, England, assignors to International Computers and Tabulators Limited, London, England
Filed Apr. 9, 1968, Ser. No. 719,904
Claims priority, application Great Britain, Apr. 22, 1967, 18613/67
Int. Cl. F15c 1/10
U.S. Cl. 137—81.5 3 Claims



A monostable pure fluid device is described in which the values of the control pressures at which the power stream is switched from its normal outlet and at which the power stream resets to its normal outlet respectively are substantially equal. The reaction chamber of the device has substantially parallel top and bottom surfaces and a small interruption is formed in one of the surfaces by a projection, step or depression in the surface.

3,592,211
PRESSURE-REGULATING VALVE
Cyril Spalding, Welwyn Garden City, England, assignor to Hawker Siddeley Dynamics Limited, Hatfield, England
Filed Nov. 26, 1968, Ser. No. 779,280
Claims priority, application Great Britain, Nov. 30, 1967, 54676/67
Int. Cl. F15b 5/00; F15c 3/02
U.S. Cl. 137—83 3 Claims

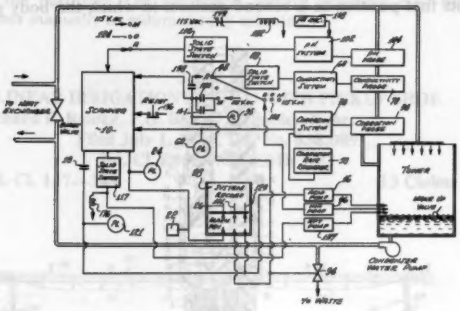


A pressure-regulating valve is provided, especially for an antiskid braking system, which has two fluidic stages of amplification, the first being a jet pipe regulator device and the second a spool valve in a cylinder. The input signal to the second stage is applied to one end of the spool valve and proportions of the supply and regulated output pressures are applied to the opposite end.

3,592,212
WATER TREATMENT SYSTEM
James A. Schleimer, 799 Via Ondulano, Ventura, Calif., and Arthur M. Beavens, Manhattan Beach, Calif.
Filed Dec. 18, 1969, Ser. No. 886,287
Int. Cl. G05d 11/08
U.S. Cl. 137—93 8 Claims

A water treatment system having a scanner circuit which monitors and controls and takes corrective action upon receiving signals from pH-sensing apparatus, conductivity-sensing apparatus, or corrosion rate sensing apparatus, singly

or together, and provides electrical timing means for stopping or starting acid or alkaline feed equipment, bleed valves in the system, and various pump means for adding chemicals to the system.

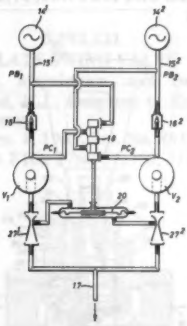


3,592,213

FUEL FLOW PROPORTIONER

Charles Philip Smith, Wolverhampton, England, assignor to H. M. Hobson Limited, London, England

Filed Nov. 12, 1969, Ser. No. 875,933
Claims priority, application Great Britain, Nov. 12, 1968, 53,596/68
Int. Cl. G05d *11/00*
U.S. Cl. 137—98 5 Claims



The invention provides a fuel flow proportioner for aircraft which comprises two fluidic vortex valves, one interposed in the flow line from one fuel tank and the other interposed in the flow line from another fuel tank, and mechanism for sensing the fuel pressures at the outlets of the two vortex valves and operative, in the event of these outlet pressures becoming unbalanced due to excess flow in one of the flow lines, to increase the control flow supplied to the vortex valve in the line having the higher outlet pressure.

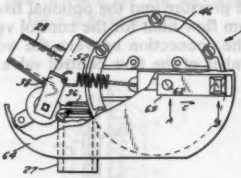
3,592,214

FLUID CONTROL DEVICE FOR LAUNDRY MACHINES

Harold Louis Woehler, Herrin, and Billy Gene Jack, Johnston City, both of, Ill., assignors to Fedders Corporation, Edison, N.J.

Filed Dec. 4, 1968, Ser. No. 781,214
Int. Cl. D06f *41/00, 39/08;* G05d *7/06*
U.S. Cl. 137—109 13 Claims

A suds-saver device for use with laundry machines having a pump for emptying suds water to a storage reservoir and rinse water to the drain. The device includes a transverse slide operatively connected to a valve to first direct suds water, under pump pressure, to the reservoir and operable, by the pressure of the suds water, to automatically position the valve to subsequently direct rinse water to the drain. When the slide is returned to its first position, actuation of the pump in the reverse direction causes the suds water to return to the machine.

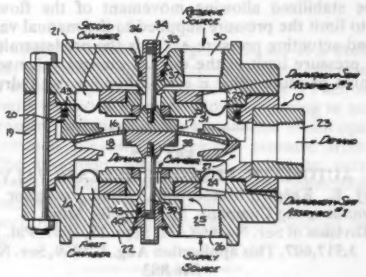


3,592,215

AUTOMATIC CHANGEOVER VALVE ASSEMBLY

James W. Davis, New Britain, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed Dec. 2, 1969, Ser. No. 881,565
Int. Cl. G05d *16/06*
U.S. Cl. 137—113 6 Claims



An automatic changeover valve assembly for controlling the selective withdrawal of fluid from either one of two cylinders or containers, one serving as the main supply source and the other as a standby or reserve source. The valve assembly comprises a Belleville spring supporting a double-ended valve plug within a demand chamber communicating with a demand line. The first plug cooperates with a valve seat mounted on a diaphragm enclosing a first fluid chamber communicating with a supply fluid source, and the second plug cooperates with a valve seat mounted on a diaphragm enclosing a second fluid chamber communicating with a reserve source. Initially, the first plug is displaced from its related diaphragm seat, whereby the supply fluid is admitted into the demand chamber, whereas the second plug is fitted in its related diaphragm seat, whereby flow of reserve fluid is blocked. But when the pressure of the supply fluid drops, this gives rise to a differential pressure between the demand chamber and the reserve fluid chamber which in turn compels the actuating diaphragm to move and causing the Belleville spring to snap and thereby reverse the relationship of the plugs and valve seats.

3,592,216

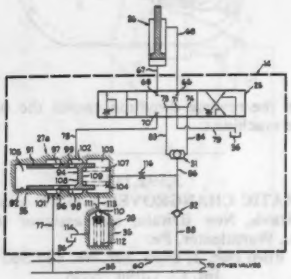
FLOW CONTROL VALVE

Kenneth G. McMillen, Wolcottville, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 6, 1968, Ser. No. 757,960
Int. Cl. G05d *11/00;* F15d *11/10*
U.S. Cl. 137—115 33 Claims

A flow control valve for use with a manual control valve controlling a hydraulic motor, the flow control valve having a piston therein having a variable orifice and an optional fixed orifice connected between the variable orifice and the inlet of the manual valve. The flow control valve is controlled by a variable orifice established by the manual valve between the inlet to the manual valve and an outlet port of the manual

valve connected to the hydraulic motor. The flow control valve includes a pressure chamber connectable to the load-actuating pressure of the manual valve whereby the variable orifice will be sized to provide a pressure in accordance with the work port pressure and the optional fixed orifice providing a maximum flow limit for the control valve. An orifice is provided in the connection between the work ports and the pressure chamber of the flow control valve and the pressure



chamber is further connected to a relief valve whereby when the relief valve is open the pressure in the pressure chamber will be stabilized allowing movement of the flow control valve to limit the pressure supplied to the manual valve when the load-actuating pressure exceeds the predetermined maximum pressure limit of the manual control valve whereby a maximum pressure value is established for the hydraulic motor.

3,592,217

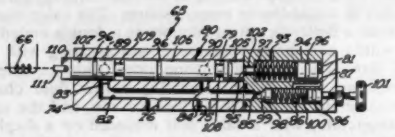
AUTOMATIC PRESSURE RELEASE VALVE

Stanley E. Keagle, Minneapolis, Minn., assignor to Earll Manufacturing Company, Minneapolis, Minn.

Division of Ser. No. 668,431, Sept. 18, 1967, Pat. No. 3,517,607. This application Aug. 1, 1969, Ser. No. 846,883

Int. Cl. G05d *11/00*; **F15b** *13/02*

U.S. Cl. 137—115 **17 Claims**



A fully automatic bottle and can crusher in which articles are fed, one at a time, into the crusher by a feeder. The feeder control is responsive to the presence of an article in the feeder, and the crusher control is responsive to the presence of an article in the crusher. The crusher is operated by an electrically actuated hydraulic release valve which discontinues operation of the crusher at a predetermined hydraulic pressure. The valve has a hydraulically actuated means for moving a spool to a pressure release position in response to the predetermined pressure.

3,592,218

PRESSURE GAUGE

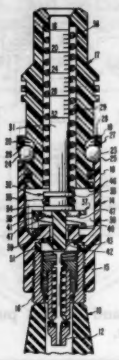
Billy Lynn Guy, 240 Shady Lane, Lexington, Ky., and Walden Sam Campbell, 1013 Celia Drive, Lexington, Ky.

Filed July 31, 1969, Ser. No. 846,518

Int. Cl. F16k *15/20*

U.S. Cl. 137—227 **20 Claims**

A combined gauge and inflator for a tire includes a support member threaded on the tire stem with a body slidably disposed within the support member and locked in a first position. The body has a passage extending therethrough with a spring-biased piston slidably disposed therein. With the body in the first position, the piston rests against a spring-biased plunger, which opens the valve in the tire stem when the plunger spring is overcome. The plunger spring is overcome either by an air chuck acting on the piston to move the piston against the plunger or when the body is moved from its first position to a second position in which the body engages the plunger. When the body is moved against the plunger, sealing means on the piston seal the body passage so that air pressure in the tire moves the piston relative to the body. A scale on the piston cooperates with a marker on the body to indicate the pressure of the tire.



3,592,219

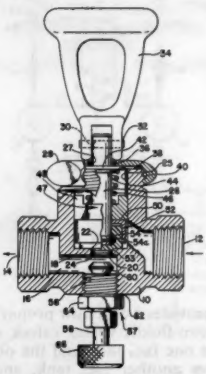
CAM-OPERATED VALVE WITH SCRAPING VANES

Elroy J. Giese, Cleveland, Ohio, assignor to Tomlinson Industries, Inc., Cleveland, Ohio

Filed May 5, 1969, Ser. No. 821,759

Int. Cl. F16k *29/00*, *51/00*

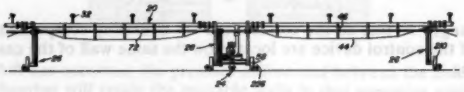
U.S. Cl. 137—242 **13 Claims**



This invention relates to a valve particularly adapted for use in controlling flow through water feed lines for commercial coffee urns. The valve includes a valve body having an inlet and an outlet interconnected by a fluid passageway. Intermediate the ends of the passageway is a shoulder or partition, apertured to permit flow therethrough. A handle operates to open and close the valve by reciprocating a stem which extends into the passageway through an opening in the valve body. On the inner end of the stem is attached a resilient closure member adapted to engage a first sealing seat provided on one side of the partition and encircling the aperture through such partition. Received over the closure member is a cuplike shield which covers a major portion of the closure member. Disposed above the shield and circumscribing the stem is a stem guide having a plurality of vanes radiating outwardly from the stem. The stem guide centers the stem and, by rotation of the vanes, produces a scraping action which helps to reduce "liming" of certain interior valve surfaces. The stem is biased downwardly toward the first sealing seat by a spring which is compressed between the

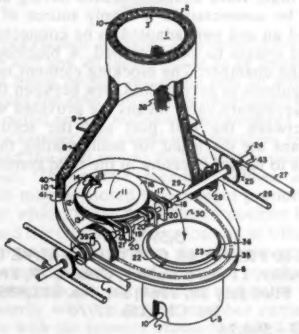
top of the stem guide and the undersurface of a bonnet nut through which the stem passes. The valve may also include an antisiphon control assembly which acts in concert with a second sealing seat encircling the aperture on the other side of the partition. The antisiphon control assembly may be either manually or automatically actuated.

3,592,220
LINEAR IRRIGATION SYSTEM WITH PICKUP SHOE
Richard F. Reinke, P.O. Box 272, Deshler, Nebr.
Filed July 1, 1969, Ser. No. 838,089
Int. Cl. B05b *9/02*; **E01h** *3/02*
U.S. Cl. 137—344 **13 Claims**



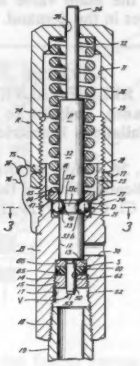
An elongated pipe boom provided with irrigation sprinkler heads thereon supported by a plurality of driven wheeled assemblies including a central driven unit having a pickup shoe thereon for receiving water from a supply pipe with the entire assembly being driven back and forth in a linear direction in relation to an area to be irrigated. All of the supporting assemblies are retained in alignment by a timing mechanism and a control is provided so that the pump associated with the pickup shoe and the water supply line will have an intake capacity balanced with the water supply so that the pickup shoe will not intake air into the system.

3,592,221
PLATE SWING VALVE
Arthur C. Worley, Morristown, and Dominic Cicchino, Rockaway, both of, N.J., assignors to Esso Research and Engineering Company
Filed Dec. 1, 1969, Ser. No. 881,072
Int. Cl. F16k *27/00, 11/00, 31/54*
U.S. Cl. 137—375 **12 Claims**



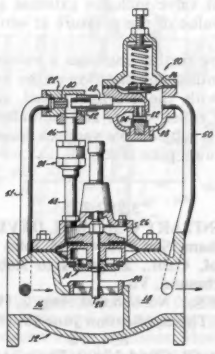
A three-way plate valve for directing a gas stream at high temperature is characterized by an upper inlet port, a pair of adjacent outlet ports and a closure plate for either outlet port pivoted therebetween. The closure plate includes a pair of spaced sealing surfaces for contacting the outlet ports and is attached to a shaft which is journaled in bearings within the valve body. Operation of the valve is effected by an external drive mechanism.

3,592,222
RELIEF VALVE
John B. Goss, and John E. Stachowiak, both of Harris County, Tex., assignors to American Aero Industries, Inc.
Filed Dec. 3, 1969, Ser. No. 881,828
Int. Cl. F16k *17/00*
U.S. Cl. 137—467 **10 Claims**



A relief valve for releasing surges of liquid at a predetermined relief pressure in fluid-pumping systems comprising a valve held in closed position in its housing by a latch means which permits the valve to move without opening to accommodate pressure variations in the system and which opens at a predetermined pressure to release pressure from the system. The invention also includes means to vary the predetermined pressure at which such valve opens and also means to manually reset the valve after discharge to release again at such predetermined relief pressure without further adjustment.

3,592,223
PILOT-OPERATED MODULATING VALVE SYSTEM AND FLOW STABILIZER INCORPORATED THEREIN
James R. Reese, Santa Anna, Calif., assignor to Cla-Val Co., Costa Mesa, Calif.
Filed Nov. 6, 1969, Ser. No. 874,449
Int. Cl. G05d *16/00*
U.S. Cl. 137—489 **20 Claims**



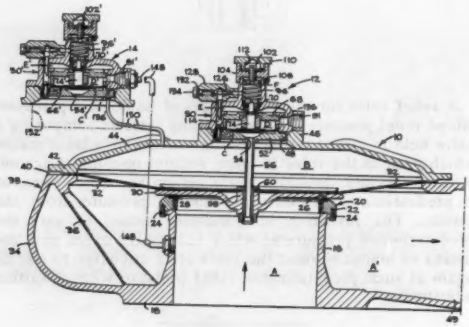
The valve system comprises a main valve including a diaphragm-operated poppet separating an inlet side from an outlet side, a pilot valve for opening and closing the main valve in response to a predetermined pressure or flow condition, and a restrictor (for example, the inlet nozzle of an

ejector) coupled to pass fluid from the inlet side to a flow stabilizer and to the pilot valve. The flow stabilizer is connected between the ejector and a diaphragm chamber in the main valve. The stabilizer passes fluid from the ejector to the diaphragm chamber, and at other times from the diaphragm chamber to the ejector, at a restricted rate for slowly opening and closing the main valve in response to slow or small changes in the demand, and at much faster rates for rapidly opening and closing the main valve in response to sudden and substantial changes in the demand.

3,592,224
RELIEF VALVE

Louis Bois, Sens, France, assignor to Societe Technique Et Commercial D'Installations Industrielles "Luceat,", , Sens (Yonne), France

Filed Nov. 26, 1969, Ser. No. 880,031
Claims priority, application France, Dec. 20, 1968, 179,512
Int. Cl. F16k *17/19, 17/10*
U.S. Cl. 137—492 **15 Claims**



A relief valve of the diaphragm type that provides pressure and vacuum relief for storage vessels. The relief valve includes a pressure pilot valve that is effective to actuate the relief valve in response to an overpressure in the storage vessel, and the pilot valve includes external adjustment means for varying the value of the pressure at which it actuates the relief valve.

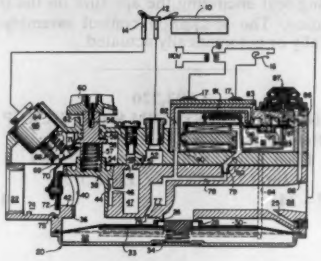
The relief valve further includes a vacuum pilot valve, of substantially identical construction as the pressure pilot, that communicates with the storage vessel and the actuating chamber of the relief valve, and actuates the relief valve when the vessel is subject to a vacuum greater than the value at which the vacuum pilot is set.

3,592,225
UNITARY CONTROL DEVICE

Marvin M. Graham, San Pedro, and John W. Wright, Long Beach, both of, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 658,000, Aug. 2, 1967, Pat. No. 3,513,873. This application June 19, 1969, Ser. No. 834,770
Int. Cl. G05d *27/00;* **F16k** *31/165*
U.S. Cl. 137—495 **10 Claims**

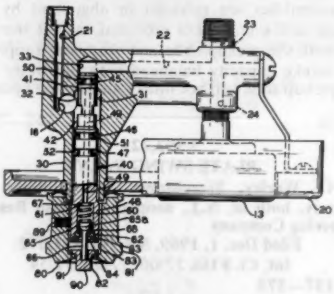
A unitary control device for main and pilot burner apparatus having a differential pressure operated diaphragm valve operated by an internal bleed line which is subject to pressure regulation and to on-off control by a dual valve permitting a bypass bleed flow to assure closure of the main diaphragm valve. The control device casing houses conventional manual and safety valves adjacent its inlet port and includes an impurity collector in its inlet chamber as being arranged so that all the connections for operating components of the control device are located on the same wall of the casing.



3,592,226
PRESSURE CONTROL APPARATUS

John A. Graham, Jr., Toledo, Ohio, assignor to Hadley Manufacturing Company, Toledo, Ohio

Filed Dec. 15, 1967, Ser. No. 691,006
Int. Cl. F16k *37/00, 11/10, 11/07*
U.S. Cl. 137—557 **14 Claims**



A novel system which utilizes pressure control apparatus comprising main valve chamber means having an entry port adapted to be connected to a supply source of fluid under pressure and an exit port adapted to be connected to a pressurized fluid system to be controlled. A blocking element is located in the chamber. The blocking element may be selectively manipulated to permit fluid flow between the entry and exit ports. Secondary valve means are provided with communication between the exit port and the secondary valve means. Means are disclosed for manipulating the secondary valve means to reduce pressure in the fluid system being controlled.

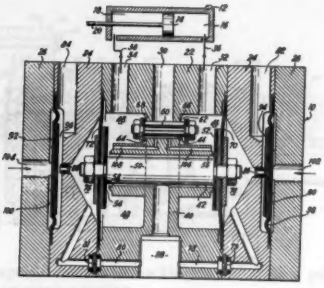
3,592,227
FLUID PRESSURE CONTROL VALVE UNIT

Charles Rivolier, 11 rue d'Aulnoy, Cesson, 77, France

Filed July 18, 1969, Ser. No. 842,985
Int. Cl. F16k *11/10*
U.S. Cl. 137—596.14 **8 Claims**

A control valve for switching high-pressure fluid from a first outlet to a second outlet, to position a piston in response to a pressure signal. The pressure signal moves a diaphragm to permit the high pressure to be selectively admitted to opposed inner chambers. A movable wall separates each inner chamber. The movable walls are connected by a shaft retained in a bore connected to the high-pressure fluid. Low pressure from the atmosphere controlled by an exhaust valve is communicated to the second outlet simultaneously with high pressure being communicated to the first outlet. Upon the outlet pressure being received by the inner chambers a

pressure differential is created across the movable walls causing a valve to seat on the bore from the high pressure permitting high pressure to the other inner chamber. Once the



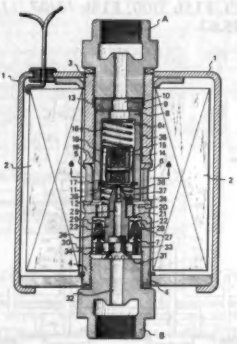
shift has occurred, the pressure differential between the inner chamber will retain the movable walls in that operative position until a subsequent pressure signal is received.

3,592,228

MAGNET VALVE

Tetsuo Kukuminato, and Akira Ohashi, both of 684 Chigusashinden, Osawa-machi, Kimitsu-gun, Chiba-ken, Japan

Filed Aug. 6, 1969, Ser. No. 847,874
Claims priority, application Japan, Aug. 8, 1968, 43/55823
Int. Cl. F16d *65/24*
U.S. Cl. 137—598 7 Claims



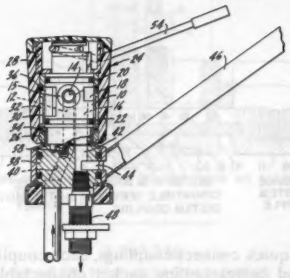
A valve construction includes a cylinder having an inlet fitting at one end and an outlet fitting at an opposite secondary end and being divided internally into an inlet chamber portion adjacent the inlet end and an outlet chamber portion adjacent the outlet end. A nozzle-shaped member is disposed in the outlet chamber and urged in a direction by a washer element toward the inlet end so that its nozzle points into the inlet chamber. The nozzle member defines an interior passage which may be closed by a poppet portion of a slide valve member which, in the nonactuated position is urged by a spring toward the inlet end into a position at which it opens the passage to the nozzle member. An electromagnetic coil is provided to cause movement of the valve member which is formed as a magnetically attractable armature so that it will move downwardly with the poppet member carried thereby in accordance with the primary pressure exerted through the inlet to overcome the biasing force of the spring and to at least partially close the passage of the nozzle member. A portion of the inlet flow is divided at the nozzle member and flows around the nozzle member into an annular passage defined therearound at the outlet chamber and which is sealed by a lip shaped tacking. During the primary pressure flow conditions, a portion of the liquid will pass around the packing and exit out through the outlet wherein an excessive pressure will cause an annular flange member to move upwardly to seal the connection between the outlet and inlet passages which is formed around the nozzle member.

3,592,229

OPERATING STRUCTURE FOR A TWO-WAY SINGLE HANDLE MIXING FAUCET

Alfred M. Moen, 25 Lakeview Drive, Grafton, Ohio

Filed Nov. 10, 1969, Ser. No. 875,042
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.17 22 Claims



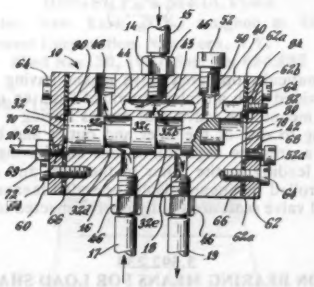
A single handle mixing faucet having a body member and an external sleeve. The body member includes hot and cold water passages which terminate in ports on the body member exterior. There is an outlet passage in the body member. The sleeve includes a mixing chamber and is reciprocal and rotatable on the body member to selectively control communication between the hot and cold water ports, the mixing chamber and the outlet passage. There are means extending upwardly from the body member interconnecting the sleeve and body member to prevent removal of the sleeve but yet provide for limited relative rotation and reciprocal movement between the two members.

3,592,230

BACK PRESSURE DIRECTIONAL CONTROL VALVES EMPLOYING PILOT AIR OF LOW VOLUME AND PRESSURE

Miroslav J. Piroutek, Stamford, Conn., assignor to Self-Matic Valves Corp., Stamford, Conn.

Filed Apr. 23, 1969, Ser. No. 818,568
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.66 17 Claims



The disclosed pneumatically actuated control valves utilize exceptionally low volume and low-pressure pilot air to shift the valve spool between valve positions. Hose having valveless, open ends continuously bleed pilot air and are simply adapted to have their open ends blocked by external system elements to develop sufficient back pressure for shifting the spool between valve positions. The volume of pilot air is adjustable so as to regulate the rate of back pressure buildup. In a self-actuated valve embodiment, pilot air blockage is performed by the spool itself and the valve cycles between valve positions automatically.

3,592,231

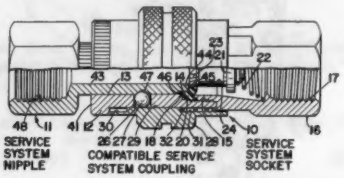
QUICK CONNECT COUPLINGS WITH SELECTIVE CONNECTION MEANS

Ted L. Lamb, San Lorenzo, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation of application Ser. No. 620,596, Apr. 13, 1967, now abandoned. This application Oct. 17, 1969, Ser. No. 867,414

Int. Cl. F16l *37/28, 37/22*

U.S. Cl. 137—614.04 1 Claim



A pair of quick connect couplings, each coupling including a nipple and corresponding socket connectable with each other, and each nipple and socket including means to prevent connection between noncorresponding nipples and sockets.

3,592,232

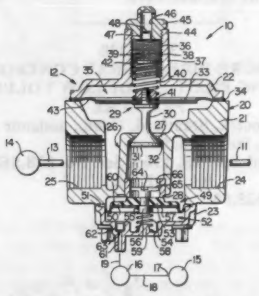
FUEL CONTROL SYSTEM AND PNEUMATICALLY OPERATED VALVE MEANS THEREFOR OR THE LIKE

Arthur L. Good, Elkhart, Ind., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 12, 1969, Ser. No. 823,589

Int. Cl. G05d *16/06*

U.S. Cl. 137—614.21 20 Claims



A pneumatically operated valve means having a housing means provided with an inlet separated from an outlet by a valve seat means, the valve seat means having a first valve seat leading to one of the inlet and outlet and being controlled by a pressure regulator means and having a second valve seat leading to the other of the inlet and outlet and being controlled by pneumatically operated means. The first and second valve seats are fluidly interconnected together.

3,592,233

COMMON BEARING MEANS FOR LOAD SHAFT AND ROTARY VALVE IN FLUID PRESSURE DEVICE

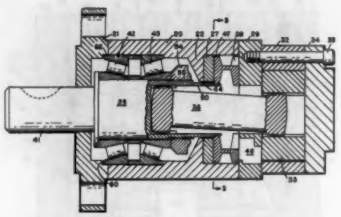
George V. Woodling, 22077 West Lake Road, Rocky River, Ohio

Filed Nov. 28, 1969, Ser. No. 880,677

Int. Cl. F16k *11/02*

U.S. Cl. 137—625.21 7 Claims

Common bearing means are provided for a load shaft and a rotary valve in a fluid pressure device. The load shaft and rotary valve are mounted in two separate compartments of a housing. A hollow drive shaft extension is carried by the load shaft in one compartment and extends into the other compartment upon which the rotary valve is mounted. The common bearing means directly supports the load shaft and indirectly supports the rotary valve through the hollow drive shaft extension. The common bearing means preferably comprises a pair of tapered roller bearings which provide both radial and axial thrust. The rotary valve is radially spaced from the housing in which it is mounted and makes an axially slidable connection with the hollow drive shaft extension and thus is not affected by radial and axial movements of the load shaft.



3,592,234

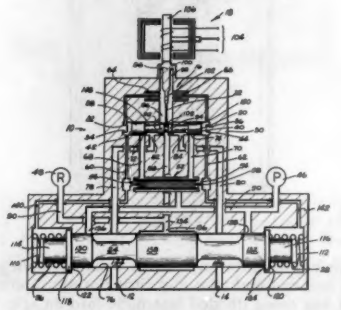
STAGED-FLOW VALVE

George T. Baltus, Tonawanda, N.Y., assignor to Bell Aerospace Corporation

Filed July 25, 1969, Ser. No. 844,784

Int. Cl. F15b *5/00*; F16k *11/07, 11/10*

U.S. Cl. 137—625.62 11 Claims



A double-legged two-stage servo valve in which metering to load is provided by both a low-flow second stage and a high-flow second stage, the high flow stage becoming operative when a predetermined pressure differential is exceeded. Specifically, the first stage is a flapper valve driving, with mechanical feedback, a low-flow second stage four-way spool valve over a portion of the full signal input and driving a high-flow second stage spring-centered four-way spool vale for the remainder of the signal range.

3,592,235

DIFFERENTIAL PRESSURE VALVE

Milton T. Fore, Houston, Tex., assignor to Bell Aerospace Corporation

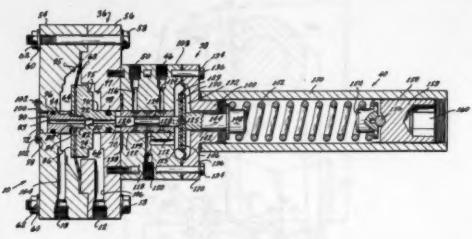
Filed July 25, 1969, Ser. No. 844,783

Int. Cl. F16k *11/07*

U.S. Cl. 137—625.66 8 Claims

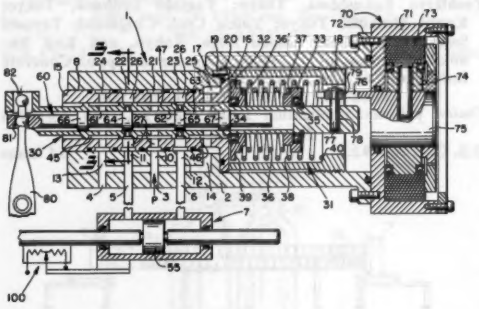
A differential pressure sensor wherein a flow control member (spool valve) is disposed in operative association

with a pressure-displaceable member (diaphragm) of the sensor so as to move therewith to open a pilot line, and which



includes spool valve self-locking so that the pilot line is locked in an open position.

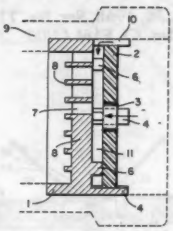
3,592,236
DUAL-INPUT SERVO VALVE
John W. Meulendyk, Kalamazoo, Mich., assignor to Pneumo Dynamics Corporation, Cleveland, Ohio
Filed June 2, 1969, Ser. No. 829,333
Int. Cl. F16k 11/22
U.S. Cl. 137—637.4 **12 Claims**



A dual-input servo valve including an inner valve sleeve having an electromechanical input device directly coupled thereto for rotation of the inner valve sleeve to control fluid flow to an actuator, and a valve plunger axially reciprocable in the inner valve sleeve by application of mechanical input to control the flow to such actuator. Should the valve plunger become stuck or jammed in the inner valve sleeve, such valve plunger and inner valve sleeve may be moved axially as a unit to control the flow to the actuator. Flow to the actuator caused by rotary movement of the inner valve sleeve can be supplemented or counteracted by appropriate axial movements of the valve plunger by itself or valve plunger and inner valve sleeve as a unit.

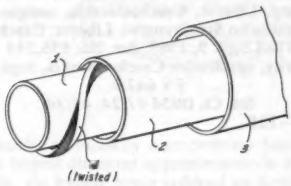
3,592,237
THROTTLE MEANS FOR MAINTAINING CONSTANT FLOW
Alwin Borschers, Kupfermuhlenweg 48, Flensborg, Germany
Filed June 23, 1969, Ser. No. 835,703
Int. Cl. F15d 1/00
U.S. Cl. 138—43 **9 Claims**

The invention relates to a throttle device for maintaining a constant flow through a pipe when the delivery pressure varies. The device includes a rigid perforate plate and a resilient disc having a central orifice, the disc being maintained in spaced relation to the plate by spacing elements extending transversely from the plate. Increased pressure in the pipe deflects the resilient disc towards the perforate plate so that the perforations of the plate are closed by the disc to a greater or lesser degree depending on the pressure. As the pressure increases the closing of the perforations reduces the



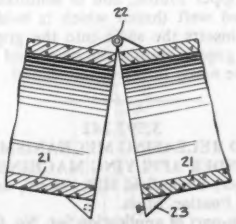
effective cross-sectional area of the pipe to maintain a constant flow through the pipe.

3,592,238
SPACER FOR COAXIAL PIPES
Ernst Scheffler, Langenhagen, and Gerhard Ziemek, Hannover, both of, Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany
Filed Aug. 25, 1969, Ser. No. 852,810
Int. Cl. F16l 9/18, 11/00
U.S. Cl. 138—114 **10 Claims**



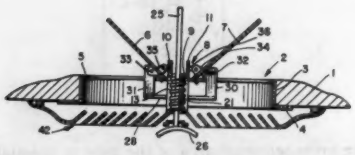
Coaxial pipes are positioned one inside the other and maintained by a helical spacer constructed from loosely piled tapes, fastened to each other in isolated points.

3,592,239
HINGED PIPE STRUCTURE
Cyrus Adler, New York, N.Y., assignor to Offshore/Sea Development Corporation, New York, N.Y.
Filed Nov. 20, 1967, Ser. No. 684,885
Int. Cl. F16l 9/22
U.S. Cl. 138—155 **5 Claims**



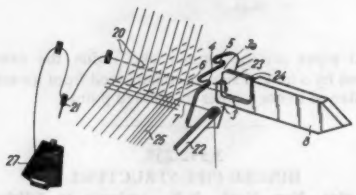
A pipe structure to be placed in an inaccessible location, e.g., below the surface of a body of water, comprising a plurality of pivotally mounted pipe sections which are attached one to the other by hinge means. Each pipe section is provided with lock structure arranged to coact with structure on the next adjacent pipe sections to lock said sections with respect to one another and thereby form a continuous fluid tight conduit.

3,592,240
DAMPER UNIT FOR CONTROLLING AIR FLOW
Warren R. Hedrick, and Henry J. Meurer, both of Holland, Mich., assignors to Allied Thermal Corporation, New Britain, Conn.
Filed Oct. 30, 1968, Ser. No. 771,835
Int. Cl. F16l *13/00*
U.S. Cl. 137—316 9 Claims



A damper unit for controlling air flow by adjustment of a pair of pivotally mounted damper blades. Adjustment of the blades is accomplished by linear movement of an operating member pivotally connected to the blades and actuated by the rotation of a worm. The worm has a noncircular opening there-through to receive a rod of similar cross section. The rod is frictionally, but movably, held in the opening through the worm for adjustment lengthwise thereof to accommodate louvered face plates of various heights.

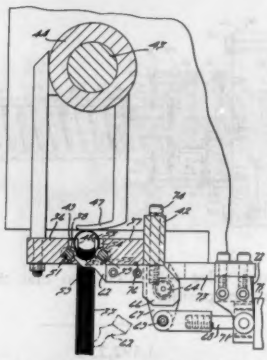
3,592,241
WEFT THREAD CONTROL APPARATUS
Vladimir Svaty, Liberec, Czechoslovakia, assignor to Elitex, Zavodig Textilniho Strojirenstwi, Liberec, Czechoslovakia
Filed Sept. 9, 1969, Ser. No. 856,344
Claims priority, application Czechoslovakia, Sept. 13, 1968, PV 6428
Int. Cl. D03d *47/24, 47/34*
U.S. Cl. 139—125 10 Claims



After the pick of the reversible gripper shuttle with a clamp weft thread, a control member, mounted on the slay, is driven to pull out the picked weft thread from the clamping means of the gripper shuttle, and to simultaneously sever a previously picked weft thread which is held by a feeding member which inserts the same into the gripper shuttle so that the reverse gripper shuttle can be picked in the opposite direction with the newly inserted weft thread.

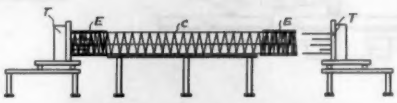
3,592,242
HOLDING AND RELEASING MECHANISM FOR SPIRAL BINDER APPLYING MACHINES
Hans A. Sickinger, Bloomfield Hills, Mich., assignor to Hans Sickinger Co., Pontiac, Mich.
Continuation-in-part of application Ser. No. 662,013, Aug. 21, 1967, now Patent No. 3,486,537, dated Dec. 30, 1969. This application Apr. 1, 1969, Ser. No. 811,731
Int. Cl. B21f *21/00*
U.S. Cl. 140—92.94 3 Claims

A spiral binder applying machine having two guide roller supports between which a pack of sheets is clamped, the spiral wire being guided by slots in the supports. The stationary support has a pair of hooks pivotally-actuatable between upper supporting positions engageable with looseleaf holes in the pack and lower releasing positions. In one embodiment of the invention, a pair of stripping plates



are provided for facilitating removal of the pack from the hooks as they approach their releasing positions.

3,592,243
METHOD OF FABRICATING PC CONCRETE PIPE REINFORCING
Yoshikiyo Fukushima, Tokyo; Yasushi Ishihara, Tokyo; Kenzo Momota, Tokyo; Yasuo Usui, Chigasaki; Tuyoshi Sakumura, Tokyo; Satoru Sogo, Tokyo, and Koji Nunokawa, Tokyo, all of, Japan, assignors to Nippon Concrete Industries Co., Ltd., Tokyo, Japan
Filed Jan. 29, 1969, Ser. No. 794,900
Claims priority, application Japan, Feb. 26, 1968, 43/11924
Int. Cl. B21f *3/02*
U.S. Cl. 140—92.2 3 Claims

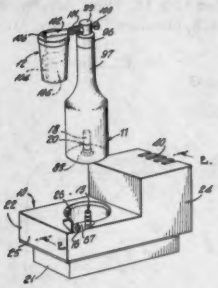


A method of fabricating reinforcements for PC concrete pipe comprising forming a central cage structure and two end cages of slightly larger diameter than said central cage, positioning the said end cages at each end of said central cage structure, inserting tension reinforcing material along the length of said cage structure, without intertwining said tensioning reinforcing members, and through holes formed on the end surfaces of metal fittings, forming hook ends on the tension reinforcing members, and extending said metal fittings to contact said hook ends and place the tension reinforcing members under tension, the central cage structure being free to move within the end cages, and the end cages being attached to the end surface metal fittings.

3,592,244
FLASK-CHARGING APPARATUS
Edward B. Chamberlin, 112 Fifth St., Garden City, N.Y.
Filed June 28, 1968, Ser. No. 741,075
Int. Cl. B67c *3/12, 3/26*
U.S. Cl. 141—14 6 Claims

Apparatus adapted for charging portable gas-containing flasks adapted for use with spraying devices. The apparatus includes a compressor driven by an electric motor, the operation of the motor being initiated by a switch engaged by the flask when the flask is operatively mounted at the charging station of the apparatus. A pressure-operated switch is disposed in the motor circuit for shutting off the motor driving the compressor when the flask has been charged to the desired predetermined pressure. The apparatus is provided

with a novel check valve which is disposed between the compressor and the flask-charging station. The apparatus has a



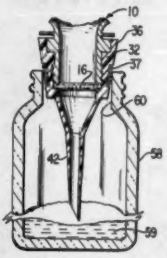
split housing, the parts of the housing being secured together by means which also secures the motor and the compressor to the housing.

3,592,245

UNIVERSAL DISPENSING DEVICE FOR INTRAVENOUS MEDICATIONS

George H. Schneller, Devon; Ralph S. Levi, Norristown; Howard J. Levin, Norristown, and Stephen W. Goodsir, King of Prussia, all of, Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Sept. 24, 1968, Ser. No. 762,063
Int. Cl. A61j 1/00
U.S. Cl. 141—25 7 Claims



The disclosure is directed to a universal dispensing package for medicaments to be dissolved in a parenteral container prior to use. A container is provided with a cap which first, has a hollow piercing device for dispensing a contained medicament into a "closed system" parenteral solution container, and, second, has a frustoconical shank adapted to engage the interior surface of the neck of an "open system" parenteral solution container. A membrane filter may be disposed between the container and the cap. An outer sheath is provided over the cap and is scaled in place.

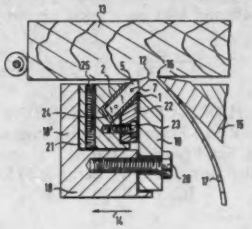
3,592,246

APPARATUS FOR MAKING WOOD WOOL

Heinz Barke, Felsenbachstrasse 18, 5904 Eiserfeld-Niederschelden (Sieg), and Heiner Barke, Weinweg 47, 84 Regensburg, both of, Germany

Continuation-in-part of application Ser. No. 644,028, June 6, 1967, now abandoned. This application July 16, 1969, Ser. No. 842,097
Int. Cl. B27l 11/04
U.S. Cl. 144—186 8 Claims

In an apparatus for making excelsior, a shaving knife cooperates with an adjacent slitting knife so that their cutting edges are adjacent. The slitting knife consists of a tightly assembled stack of interleaved blades and washers, the ground cutting edges of the blades lying in a common plane extending obliquely to the cutting edge of the shaving knife. The cooperating cutting plane of the slitting knife and the cutting edge of the shaving knife extend in the same direction transversely across a wood log or board from which excelsior is made.

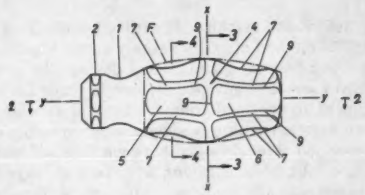


3,592,247

HANDLE FOR SCREWDRIVERS OR THE LIKE

Johannes J. Solf, Ludwigsburg, Germany, assignor to Fisma Hermann Werner, Wuppertal-Hahnerberg, Germany

Filed July 31, 1968, Ser. No. 749,126
Claims priority, application Germany, July 31, 1967, P 16 28 088.9
Int. Cl. B25g 1/10
U.S. Cl. 145—61 7 Claims



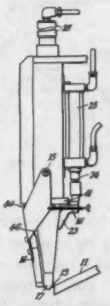
A tool handle, particularly a screwdriver handle having a ring zone of largest diameter approximately in a center zone of the handle, the handle being reduced on both sides of the ring zone constituting reduced sections including grooves angularly symmetrically arranged about the longitudinal axis of the handle, the grooves running concavely in the longitudinal direction of the handle.

3,592,248

APPARATUS FOR POSITIONING ARTICLES FOR APPLICATION TO OBJECTS

David Stuart Cameron, Loughborough, England, assignor to Charles Churchill Limited, Nottingham, England

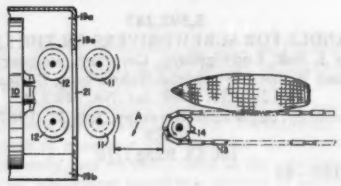
Filed June 24, 1969, Ser. No. 836,101
Claims priority, application Great Britain, June 26, 1968, 30,356/68
Int. Cl. B23b 19/06
U.S. Cl. 144—32 4 Claims



The invention provides apparatus for positioning articles for application to objects comprising a pair of jaws operable

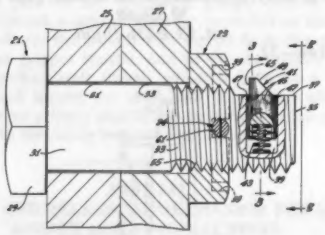
by cam means to open and close said jaws and a holder adapted to be pivoted from a position between said jaws when saiD jaws grip such an article passed to and held by said holder between said jaws upon operation of said cam means.

3,592,249
CORN-CUTTING MACHINE
Edward E. Ross, San Francisco, Calif., assignor to Del Monte Corporation, San Francisco, Calif.
Filed Apr. 14, 1969, Ser. No. 815,687
Int. Cl. A23n *15/00*
U.S. Cl. 146—242 3 Claims



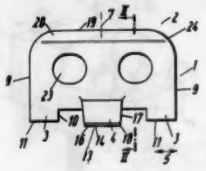
A method and machine for cutting kernels from sweet corn ears. The method employs a rotary cutter together with feed rolls which feed the ears into and through the cutter. A feed conveyor serves to advance the ears in single file and in axial alignment to the feed rolls. Undersized ears and ear fragments, together with upwardly and downwardly tipped ears are dropped through a gap between the feed conveyor and the feed rolls, while ears within the normal range of sizes are fed to the rolls and the rotary cutter means, thereby eliminating jamming.

3,592,250
SELF-RETAINED BOLT
George J. Petroshanoff, Torrance, Calif., assignor to Tridair Industries, Redondo Beach, Calif.
Continuation of application Ser. No. 784,057, Dec. 16, 1968, now abandoned. This application Apr. 7, 1970, Ser. No. 24,421
Int. Cl. F16b *39/00*
U.S. Cl. 151—6 6 Claims



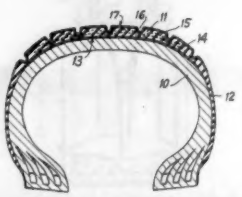
A self-retained bolt which may include a head, a shank having threads thereon, a pawl mounted for generally radial movement within the shank and means for biasing the pawl radially outwardly. A nut can be threaded onto the bolt for cooperation therewith in securing together two or more members. The pawl acts in various ways to prevent inadvertent separation of the nut and bolt and/or the bolt and the members being fastened together.

3,592,251
WEB MEMBER FOR TIRE PROTECTIVE CHAINS
Anton Muller, Unterkochen, Germany, assignor to Eisen-und Drahtwerk Erlau AG., Aalen/Wurttemberg, Germany
Filed May 16, 1969, Ser. No. 825,359
Claims priority, application Germany, May 18, 1968, P 17 55 524.7
Int. Cl. B60c *27/20*
U.S. Cl. 152—243 21 Claims



The invention concerns a weblike traction member for a tire chain which has a weblike body that is apertured for receiving connecting links of the chain and with the roadway engaging edge of the body being provided with protruding regions distributed therealong and with at least one of said regions having inclined lateral walls and sharp edges about the periphery of the face thereof that engages the roadway.

3,592,252
FABRIC-REINFORCED TIRES
Jean Francis Olagnier, Ermont, France, assignor to Pneumatiques, Caoutchouc Manufacture Et Plastiques Kleber-Colombes, Colombes, France
Filed Mar. 3, 1969, Ser. No. 803,586
Claims priority, application France, Mar. 4, 1968, 142,327
Int. Cl. B60c *9/20*
U.S. Cl. 152—361 4 Claims

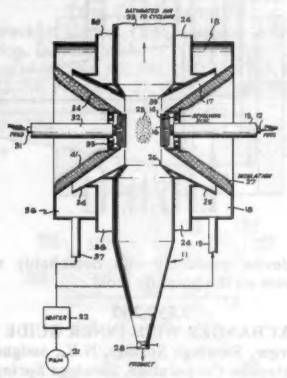


This invention relates to tires of the kind which have reinforcing fabric layers distributed within the tread thereof, one or more of such layers being undulated transversely and extending into the ribs of the tread pattern. In order to prevent any reinforcing fabric layer appearing in the bases of the grooves between the ribs of the tire pattern, the invention proposes applying a rubbery mixture having a weak flow characteristic, at least into the bases of the grooves between the ribs of the tire but, alternatively, over the whole tread pattern and into the grooves, thus parts of the applied mixture on the superficial areas of the tread rapidly wearing away to leave the mixture deep in the said grooves.

3,592,253
CONCENTRATING PROCESS AND APPARATUS
David D. Peebles, deceased, late of Davis, Calif. (by Margaret M. Peebles, Pebble Beach, Calif., Lois P. Meade, Appleton, Wisc., and James R. Bancroft, San Francisco, Calif., executors), and Wayne E. Henry, Downers Grove, Ill., assignors to Carnation Company, Los Angeles, Calif.
Filed June 13, 1968, Ser. No. 740,429
Int. Cl. B01d *1/16*
U.S. Cl. 159—4 11 Claims

The present invention generally relates to an improved process and apparatus for concentrating fluids. The process and apparatus have particular application for removing

moisture from liquids containing entrained solids or solids in solution, such as liquid foods and the like. In the process, fluid is concentrated by atomizing it into fine droplet form, injecting the atomized droplets into a band of dry high temperature gas, preferably air, passing into a concentrating



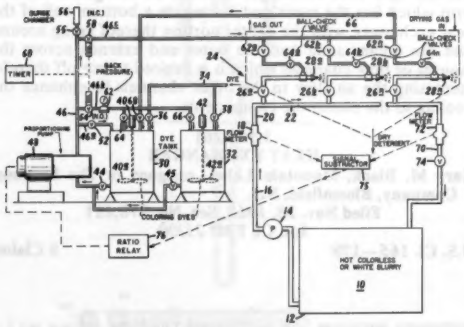
zone, subjecting the droplets to controlled shear and turbulence and collecting and withdrawing the concentrated fluid. The conditions for atomizing, injecting and concentrating are controlled to provide a figure of merit of at least about 30 where the figure of merit is defined as follows:

$$\text{Figure of merit} = 74\times10^{4}\frac{\pi D_P}{W}\left(\frac{D_P G}{\mu_b}\right)^{0.8}\left(\frac{T_a - T_s}{\Delta H_v}\right)\sin\theta$$

3,592,254
METHOD AND APPARATUS FOR PRODUCING MULTICOLORED SPRAY DRIED DETERGENT PARTICLES

Herbert E. Bauer, Saddle Brook, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Dec. 9, 1968, Ser. No. 782,192
Int. Cl. B01d *1/16*
U.S. Cl. 159—4 8 Claims

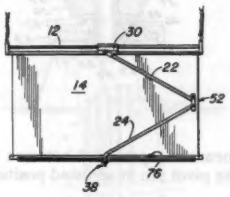


As described herein, hot colorless liquid detergent is continuously supplied under pressure to a plurality of spaced nozzles extending into a spray drying tower. A coloring solution is also supplied under pressure for controlled periods of time to the nozzles wherein the liquid detergent and the coloring solution are thoroughly mixed to form a uniformly colored liquid detergent. The nozzles spray either the colorless liquid detergent or the colored liquid detergent into the interior of the tower wherein the sprayed detergent is dried into either discrete colorless detergent particles or discrete uniformly colored detergent particles.

3,592,255
AUTOMATIC TENSIONING BAR FOR PORTABLE PICTURE SCREENS

Fred S. Potter, and Walter H. Maxson, both of Warsaw, Ind. assignors to Da-Lite Screen Company, Inc., Warsaw, Ind.

Filed Mar. 3, 1969, Ser. No. 803,652
Int. Cl. G03b *21/58*
U.S. Cl. 160—24 7 Claims

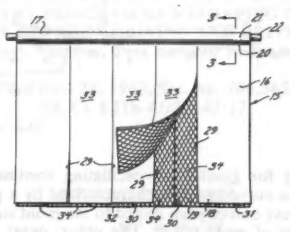


A vertically extending stretch bar having toggle arrangement therein on the rear of a hanging projection screen to automatically tension the screen surface when the screen is in fully extended position and hidden from view behind the screen case when the screen is rolled up in the case.

3,592,256
CURTAIN CONSTRUCTION

Silsby H. Knight, 6720 Park Ave., Pennsauken, N.J.

Filed Mar. 20, 1970, Ser. No. 21,426
Int. Cl. A47h *23/05*
U.S. Cl. 160—184 8 Claims



A curtain of a single integral flexible sheet folded upon itself with the overlying sheet layers secured together by a weld extending in parallel spaced relation with the fold, the sheet portions between the fold and weld defining a receiver for a suspending rod, and the facing surfaces of the layers being nonsmooth to resist adherence therebetween.

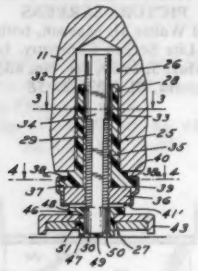
3,592,257
FOLDING DOOR CONSTRUCTION

John W. Matyas, 11300 Schaefer, Detroit, Mich.

Continuation-in-part of application Ser. No. 775,062, Nov. 12, 1968, now Patent No. 3,511,300. This application Nov. 24, 1969, Ser. No. 879,257
Int. Cl. E05d *15/26, 7/04*
U.S. Cl. 160—206 14 Claims

The folding door construction disclosed herein comprises an upper pivot assembly and a lower pivot assembly for pivoting a panel of a multipanel door in a door opening. A guide assembly guides another of the panels along a track. The lower pivot assembly comprises a sleeve frictionally held

in the panel and a pivot pin which is threaded on a nut journaled on the sleeve and slidable in an opening in the sleeve.



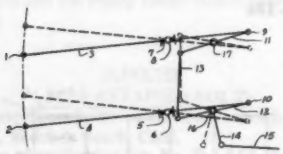
Interengaging means are provided between the nut and the sleeve to hold the pivot pin in adjusted position.

3,592,258

APPARATUS FOR GUIDING OSCILLATING CONTINUOUS CASTING MOLD

Willi Simons, Dusseldorf, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed June 24, 1969, Ser. No. 836,059
Claims priority, application Germany, June 26, 1968, P 17 58 554.5
Int. Cl. B22d *11/02, 27/08*
U.S. Cl. 164—260 **5 Claims**



Apparatus for guiding an oscillating continuous casting mold along a curved path is characterized by a pair of guide levers with one end of each linked to the mold successively in the direction of mold travel. The other, outer, ends of the guide levers are linked respectively to the ends of a pair of drive levers whose fulcrums are located between the outer ends of guide levers and the mold, and the drive levers are linked together by a connecting rod. At least one of the drive levers is connected to be driven for rocking the drive levers about their fulcrums thereby to rock the guide levers and move the mold along a curved path. At least one of the guide levers has a sliding guide.

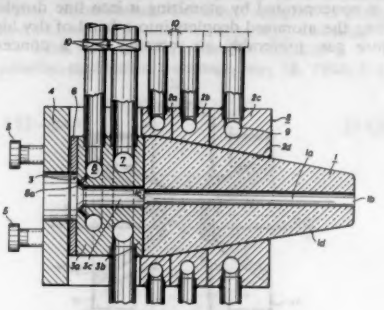
3,592,259

COOLING MEANS FOR A CONTINUOUS CASTING MOLD ASSEMBLY

Alfred Adamec; Roland Leder, and Walter Fadler, all of Vienna, Austria, assignors to Wiener Schwachstromerke Gesellschaft m.b.H., Wien, Austria

Filed Dec. 10, 1968, Ser. No. 782,646
Claims priority, application Austria, Dec. 15, 1967, A 11 330/67
Int. Cl. B22d *11/00*
U.S. Cl. 164—283 **5 Claims**

A graphite mold for use in continuous casting operations is cooled by elements mounted on the side faces and at the outlet end face of the mold. A plurality of the cooling elements are provided on the exterior of the mold to afford a variable cooling effect for the member being cast within the mold. An attachment device positively and detachably mounts the cooling elements on the graphite mold.

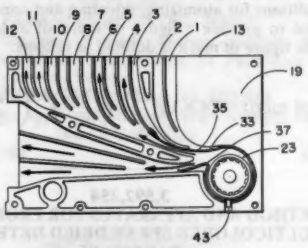


3,592,260

HEAT EXCHANGER WITH INNER GUIDE STRIP

Harvey L. Berger, Saratoga Springs, N.Y., assignor to Espey Mfg. & Electronics Corporation, Saratoga Springs, N.Y.

Filed Dec. 5, 1969, Ser. No. 882,509
Int. Cl. F28f *13/00*
U.S. Cl. 165—121 **4 Claims**



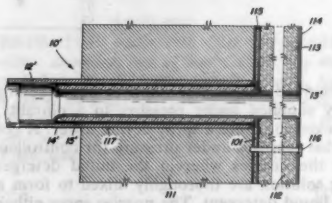
In a rectangular heat exchanger for electronic equipment wherein part of said equipment is placed on one end wall of the heat exchanger while air is brought into the heat exchanger by fan means located towards the other end wall and said air is channeled in the heat exchanger by a plurality of guide vanes extending generally radially outwards from a zone surrounding said fan means, the improvement therein wherein said heat exchanger includes an elongated resilient strip which has the inner end resting on a bottom wall of the heat exchanger, with the center portion thereof going around said fan means zone and the outer end extends across the mouths of flow channels which it is desired to cut off thereby increasing the air flow to the other channels to enhance the cooling to the electronic components.

3,592,261

HEAT EXCHANGER

Gary M. Black, Mountain Lakes, assignor to The Lummus Company, Bloomfield, N.J.

Filed Nov. 25, 1968, Ser. No. 778,411
Int. Cl. F28f *21/00*
U.S. Cl. 165—178 **8 Claims**



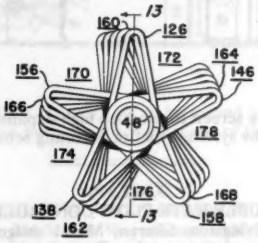
In combination with a heat exchanger, insulating tube in-

serts positioned in the inlet portion of the heat exchanger tubes which are at least coextensive with the portion of the tubes retained in the inlet tube sheet to reduce both thermal stresses and the overall temperature of the tube sheet.

3,592,262
EXTENDED SURFACE EXCHANGE HAVING A TUBULAR PORTION

Byron L. Brucken, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 501,991, Oct. 22, 1965, Pat. No. 3,482,298. Filed Oct. 22, 1969, Ser. No. 868,401
Int. Cl. F28g *1/36*
U.S. Cl. 165—184 1 Claim

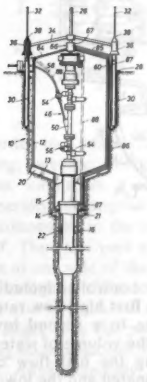


In preferred form, a heat exchanger including an elongated tubular member, with a wire fin formed along the length thereof. The fin has a plurality of axially spaced portions bent around an arcuate segment of the outer periphery of the tube for conductive heat transfer between the fin and tube. Other portions of the wire fin are looped radially outwardly of each of the bent portions to form a flow passageway between the fin and tube for convective heat transfer.

3,592,263
LOW PROFILE PROTECTIVE ENCLOSURE FOR WELLHEAD APPARATUS

Norman A. Nelson, Houston, Tex., assignor to A C F Industries Incorporated, New York, N.Y.

Filed June 25, 1969, Ser. No. 836,362
Int. Cl. E21b *33/035*
U.S. Cl. 166—.5 13 Claims

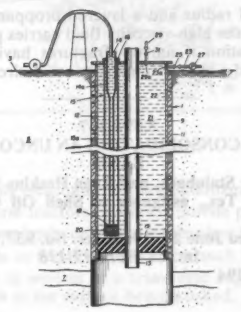


Low profile wellhead installation and servicing apparatus for subsea wellhead assemblies and the like, including a conductor guide conduit having a protective enclosure fixed to the upper extremity thereof. The guide conduit and protective enclosure are inserted into surface stratum to such extent that the upper extremity of the enclosure is located substantially at the surface level of the surface stratum, thereby presenting an extremely low profile that is not susceptible to damage by equipment ordinarily employed above the surface stratum or by other foreign objects. The guide conduit and enclosure structures are provided with means to wash the conduit and enclosure to their proper depth in the surface stratum during installation and also include a system for filling same with corrosion and marine life inhibitors or removing the inhibitors as desired. The apparatus includes a service manipulator which is receivable within the enclosure and is capable of performing various repair operations.

3,592,264
METHOD AND SYSTEM FOR IMPOSING PRESSURE ON A WELLBORE PACKER

Luther H. Williamson, Dallas, Tex., assignor to Mobil Oil Corporation

Filed May 29, 1969, Ser. No. 828,914
Int. Cl. E21b *33/12*
U.S. Cl. 166—244 10 Claims

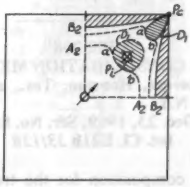


This specification discloses a method and system for increasing the hydrostatic pressure of a packer liquid on the upper side of a wellbore packer. A manometer-type fluid piston is used to increase the hydrostatic pressure by a predetermined amount.

3,592,265
INTERFACE ADVANCE CONTROL IN SECONDARY RECOVERY PROGRAM BY RESHAPING OF THE INTERFACE BETWEEN DRIVING AND DRIVEN FLUIDS

Donald L. Hoyt, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 24, 1968, Ser. No. 786,565
Int. Cl. E21b *43/20, 43/22*
U.S. Cl. 166—245 18 Claims



The interface between driving and driven fluids in a secondary recovery operation is reshaped after a cusp has developed by injection of fluids via control wells to delay the arrival of the injected driving fluid into the vicinity of a production well.

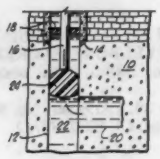
3,592,266
METHOD OF FRACTURING FORMATIONS IN WELLS

John M. Tinsley, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 25, 1969, Ser. No. 810,146
Int. Cl. E21b *43/26*
U.S. Cl. 166—283 21 Claims

The present invention is directed to a method for fracturing a subterranean formation penetrated by a well bore, the

fracturing being accomplished by alternately injecting into said formation a high-viscosity non-Newtonian fluid and a low-viscosity Newtonian fluid. The low-viscosity fluid carries propping agents into the fracture if a wide fracture having a



relatively small radius and a layered proppant configuration is desired, and the high-viscosity fluid carries propping agents into the formation if narrow fractures having a relatively large radius and a high permeability are desired.

3,592,267
METHOD OF CONSOLIDATING AN UNCONSOLIDATED SAND

Morgan Ashley Stainback, and Evan Hoskins Street, Jr., both of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed June 27, 1969, Ser. No. 837,182
Int. Cl. E21b *33/138*
U.S. Cl. 166—294 **7 Claims**

A method of consolidating an unconsolidated sand disposed in an incompetent formation by treating the formation with an emulsion of an aqueous solution of an alkali metal silicate in a hydrocarbon liquid and an aqueous solution containing a silicate precipitator.

3,592,268
SAND CONSOLIDATION METHOD

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 23, 1969, Ser. No. 887,731
Int. Cl. E21b *33/138*
U.S. Cl. 166—295 **4 Claims**

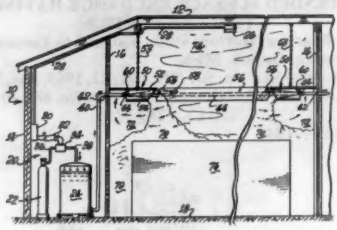
Method of and composition for the treatment of unconsolidated sandy formations to stabilize a formation sand comprising injecting a treating composition of 10—60 percent by volume of acrolein dimer, 1 to 10 percent by volume of thionyl chloride catalyst, and 30 to 89 percent by volume of a nonaromatic petroleum solvent into said formation sand, polymerizing said dimer, and forming a fluid-permeable consolidated sand in said formation.

3,592,269
SELF-CONTAINED FOAM FIRE EXTINGUISHING SYSTEM

Howard C. Stults, 7630 So. Bright Ave., Whittier, Calif.

Filed Dec. 9, 1968, Ser. No. 782,343
Int. Cl. A62c *35/46*
U.S. Cl. 169—9 **11 Claims**

A self-contained high-expansion foam fire extinguishing system providing an independent source of pressurization to a container holding a mixture of water and foam concentrate for delivery to a foam generator having a plurality of nozzle

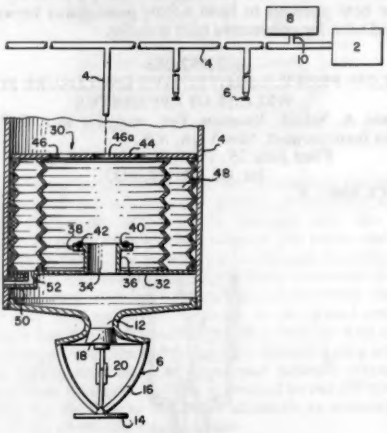


members and a screen to produce high-expansion foam upon activation of the system by a fire detecting sensor.

3,592,270
DOUBLE RATE FLOW CONTROLLER

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Turnpike, Mass.

Filed Oct. 24, 1968, Ser. No. 770,248
Int. Cl. A62c *37/06*
U.S. Cl. 169—16 **17 Claims**



A double-rate flow controller including a means for permitting fluid flow at a first high-flow rate, a means for reducing the first flow rate to a second lower flow rate and a means for regulating the volume of water passing through the flow controller during the high-flow condition before the high-flow rate is terminated and the low-flow rate begins.

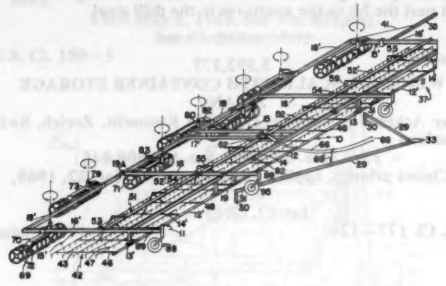
3,592,271
IMPLEMENT DRAWBAR ASSEMBLY

Fred J. Schneider, Box 940, Eston, Saskatchewan, Canada

Filed Mar. 24, 1969, Ser. No. 809,577
Int. Cl. A01b *49/02, 23/04, 35/04*
U.S. Cl. 172—175 **20 Claims**

An implement drawbar having one set of soil treating implements on the front and a second set of different implements on the rear, with castor wheels supporting the front and the second set of implements supporting the rear. The rear set is mounted for movement around a vertical pivot and

two horizontal pivots at right angles to one another and means to lift the first set of implements clear of the frame are



provided to allow the machine to be moved to the transport position without having to disconnect any of the implements.

3,592,272

MULTIPURPOSE GARDEN TOOL

Felix A. Perez, 631 Manila Way, Colma, Calif.

Filed Dec. 13, 1968, Ser. No. 783,607
Int. Cl. A01b *1/20*
U.S. Cl. 172—375 **2 Claims**

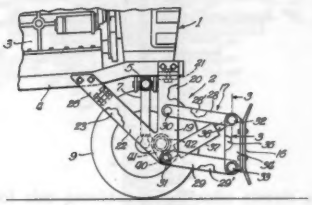
A multipurpose garden tool adapted for spading, shoveling, edge trimming, hoeing, weeding, tilling, backfilling and other gardening operations, comprises a substantially flat plate working part of generally rectangular configuration, and a handle part rigidly connected to the top edge of said plate part medially thereof. The plate part is provided with raking teeth on the top edge at one side of the handle part. One side edge has a relatively straight and flat top portion, and the opposite side edge is a convexly curved cutting edge between the top and bottom edges. The flat portion joins a convexly curved corner cutting edge adjacent the bottom edge which is also a knife edge. Advantageously, all the edge portions between the straight portion on said side edge and the side of the handle part opposite the teeth are a substantially continuous knife edge. The convexly curved side edge is suitable for use as an axe for chopping into the ground, while the bottom knife edge is useful for digging purposes and spading, while the rounded corner at the straight portion of one side edge is useful for edge trimming. The teeth are suitable for uprooting and raking. The handle part rigid with the flat working part is of a length which enables ready grasping with the hands for close work, and means for detachable connection with a handle rod that enables the tool to be used with the user standing in upright position.

3,592,273

BODILY ATTACHABLE BULLDOZING ASSEMBLY FOR TRACTORS

William E. Martin, Martin Company P.O. Box 187, Kewanee, Ill.

Filed Jan. 18, 1968, Ser. No. 698,949
Int. Cl. A01b *59/048*
U.S. Cl. 172—803 **6 Claims**



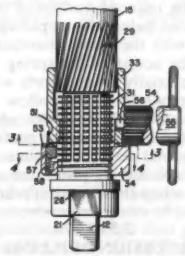
This is a bodily attachable unitary bulldozing apparatus for conventional farm tractors or similar mobile power units and comprises a completely operable mechanism to manipulate a bulldozing blade as required to position such blade upwardly or downwardly as well as at a transverse angle in a vertical plane in relation to the surface being worked.

3,592,274

TORQUE CONTROL IMPACT WRENCH LOCKING SYSTEM

Yik Y. Young, Elmira, N.Y., assignor to Ingersoll-Rand Company, New York, N.Y.

Filed Feb. 18, 1970, Ser. No. 12,274
Int. Cl. B25b *23/14*
U.S. Cl. 173—93.6 **2 Claims**

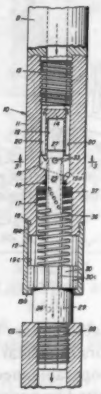


A lock mechanism for an impact wrench containing a torsion bar torque control system including a torsion bar, an annular member surrounding the torsion bar, a sleeve slideably splined on the annular member, a nut threaded on the annular member for adjusting the sleeve along the member, and a gear key for adjusting the nut and engaging gear teeth on the nut and a radial hole on the sleeve. The locking means includes a series of detent recesses on the sleeve and a spring-pressed detent contained in the nut for selectively engaging the recesses to prevent the nut from turning when the gear key is withdrawn from the mechanism. A ring is slideably mounted on the sleeve and located to force the detent to a nonlocking position when the gear key is inserted in its radial hole contained in the sleeve.

3,592,275
SPRING LOADED ADAPTER FOR DRILL RODS AND CORE BARREL

Ernest P. Fletcher, Athens, Greece, and William L. Acker, Scranton, Pa., assignors to Acker Drill Company, Inc., Clarks Summit, Pa.

Filed Apr. 11, 1969, Ser. No. 815,377
Int. Cl. E21b 17/04, 41/00
U.S. Cl. 175—317 6 Claims

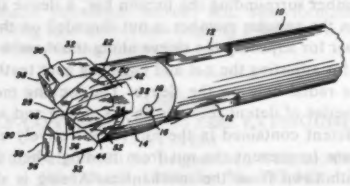


An adapter for connecting a core barrel to drill rods to provide automatic water control to a diamond drill bit and to provide cushioning pressure control to the diamond drill bit. An elongated hollow body has an internally threaded upper end to receive a hollow drill rod, a series of drill holes are spaced about an axial pocket and lead from the discharge of the hollow drill rod to a water chamber. A floating hollow piston has a threaded lower end for coupling to the top of a core barrel. Above the threaded lower end of the piston is an enlarged splined portion received in a housing that has internally longitudinal grooves for receiving the splines on the piston or vice versa and is threadedly connected to the lower end of the elongated hollow body. A spiral spring is received over a reduced portion of the hollow piston about its splined portion and extends up into an axial pocket in the elongated hollow body where its upper end rides against annular shims. The upper end of the reduced portion of the hollow piston is closed off and spaced below the upper end are radial ports that communicate with the water chamber when the hollow piston is extended by action of the spring. Spaced below the upper portholes are axially spaced ports which communicate with the water chamber when the hollow piston is retracted against the spring at which time the upper portholes are closed off. The first-mentioned set of portholes are so axially spaced from the second set that all water flow is cut off to the hollow floating connecting piston for a certain part of its axial positioning as when the core drill reaches a soft strata.

3,592,276
ROTARY PERCUSSION DRILLING APPARATUS

Harley G. Pyles, Fairmont, W. Va., assignor to A. M. Byers Company, Ambridge, Pa.

Filed Apr. 28, 1969, Ser. No. 819,811
Int. Cl. E21c 13/08
U.S. Cl. 175—410 9 Claims

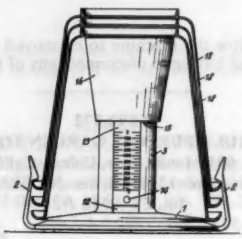


This disclosure relates to apparatus for roof drilling in mines comprising a drill bit and hollow drill steel. The drill steel has apertures in its wall near the bit for the evacuation through the drill steel of rock dust. The bit has a plurality of cutting elements separated by plane channels which diverge rearwardly along the bit head to conduct cuttings and rock dust past the bit to the apertures in the drill steel.

3,592,277
WEIGHING SCALE WITH CONTAINER STORAGE MEANS

Peter Ackeret, Schutzenweg 3, 8700 Kusnacht, Zurich, Switzerland

Filed Mar. 24, 1969, Ser. No. 809,845
Claims priority, application Switzerland, Mar. 22, 1968, 4327/68
Int. Cl. G01g 21/00
U.S. Cl. 177—126 4 Claims

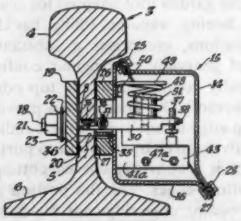


A multipurpose scale construction, particularly for household kitchen use, comprises a base, a compressible spring mounted thereon, a platform on the spring and at least one container for holding material to be weighed. The container may be inverted over the platform and spring and secured to the base protecting the scales when not in use.

3,592,278
VEHICLE WEIGHT CLASSIFIER WITH LOAD LIMIT MEANS

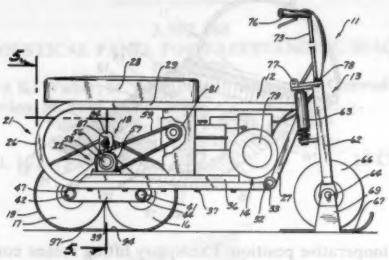
Harold L. Shumaker, Monroeville, and James B. Rupert, Bellevue, both of, Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 26, 1970, Ser. No. 40,505
Int. Cl. G01g 19/52
U.S. Cl. 177—132 10 Claims



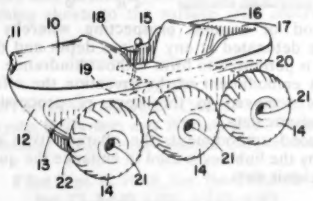
Our invention relates to a weigh rail having a crown, a web and a flange portion and an elongated slot extending transversely through the web portion between the crown and flange portions. A pivotal lever having one end is interposed into the slot so that downward deflection of the crown portion produces an angular rotation of the pivotal lever. A plurality of switching devices are disposed adjacent the other end of the pivotal lever. Each of the switching devices includes an actuator which is adapted to be selectively released in accordance with the amount of crown deflection and in turn pivotal rotation so that passing railway vehicles are categorized into weight classes.

3,592,279
SNOW SCOOTER
Harlan J. Donelson, Jr., Highway 330 West, Marshalltown, Iowa
Filed May 1, 1969, Ser. No. 821,001
Int. Cl. B62m 27/02
U.S. Cl. 180—5 7 Claims



This invention relates to a motorized snow scooter which is readily convertible to a conventional motor scooter and which comprises a frame having steering means and drive means mounted thereon. Two rear wheels, mounted in tandem, and a guide means are also mounted on the frame. A demountable, endless track is rotatably and demountably engaged with the rear wheels and the guide means.

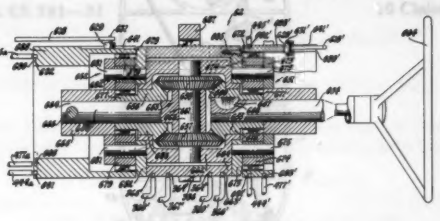
3,592,280
VARIABLE-SPEED DRIVE AND COMBINED BRAKING AND STEERING MECHANISM
Joachim Wappler, 11 Clayhill Crescent, Downsview, Ontario, and Arno C. Schwarz, 55 Oakmount Road, Apt. 1503, Toronto 5, Ontario, both of, Canada
Filed June 10, 1968, Ser. No. 746,719
(Filed under Rule 47)
Int. Cl. B62d 11/08
U.S. Cl. 180—6.2 8 Claims



A selective vehicle wheel speed control system for a motor-driven vehicle with wheels having a separate side drive train system for driving the wheels on each side, a steering and braking means in each drive train system for braking the wheels on each side which is operated in unison for braking and separately for steering the vehicle, and a transmission means with a means for engaging and disengaging the transmission means in each side drive train system to transmit the power to the wheels operated simultaneously with the braking and steering means.

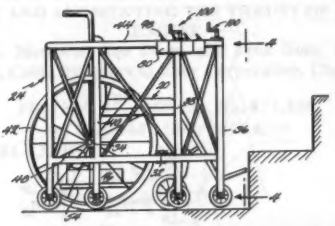
3,592,281
HYDROMECHANICAL TRANSMISSION CONTROL
Robert C. Utter, and Howard W. Christenson, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed June 17, 1969, Ser. No. 834,097
Int. Cl. B62d 11/04
U.S. Cl. 180—6.48 12 Claims

A control for an engine-driven dual-output hydromechanical transmission having hydraulic pumps and motors operative in conjunction with mechanical gearing to drive each output wherein the hydraulic ratio between the pumps and motors is controlled automatically to produce forward and reverse drive and manually to produce steer by driving. The automatic control includes a differential gearing arrangement and is responsive to engine parameters to change the hydraulic ratios of the hydraulic pumps and motors equally in the same direction while the manual control which also includes differential gearing is operative to change the hydraulic ratios equally in opposite directions thus providing steer by driving.



The control also provides a hydraulic circuit and control valving to establish and maintain the neutral position of the hydraulic pumps and motors on operator demand without the aid of a mechanical stop.

3,592,282
STAIR-TRAVERSING WHEELCHAIR APPARATUS
Robert L. Solleau, 2524 Gayosa St., Baton Rouge, La.
Filed Sept. 12, 1969, Ser. No. 857,471
Int. Cl. B62b 5/02
U.S. Cl. 180—8 A 5 Claims

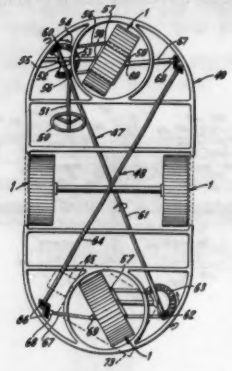


An apparatus adapted to carry a wheelchair comprises a frame having side members between which the wheelchair is mounted which frame members carry adjustable support means for raising and lowering the frame means and the wheelchair mounted therein. The adjustable support means of the apparatus comprises four pairs of jacks which are carried on the frame members with the four pairs of jacks being longitudinally spaced relatively to each other and with the jacks of each pair being transversely spaced relative to each other on the side frame members. Drive means are provided for extending and retracting the jacks with control elements regulating the drive means so that the jacks of each pair can be operated in unison to effect the simultaneous extension or retraction of any selected pair of jacks. In addition, means are provided to propel the apparatus horizontally whereby through the extension and/or retraction of selected pairs of jacks and the propulsion of the apparatus in the horizontal direction, the apparatus can ascend or descend a stair flight.

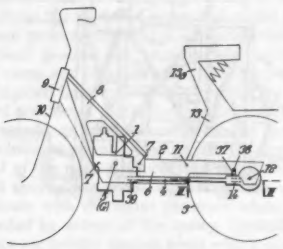
3,592,283
TRACKED VEHICLE
Jacob Fischbach, 3439 Knox Place, Bronx, N.Y.
Division of Ser. No. 687,252, Dec. 1, 1967, Pat. No. 3,495,883. Filed Sept. 25, 1969, Ser. No. 871,993
Int. Cl. B62d 11/20
U.S. Cl. 180—9.44 5 Claims

A tracked vehicle has a double-isosceles triangle support

frame, the flexible tracks at the apices of the triangles, the steering tracks pivoting at front and rear in opposite directions.



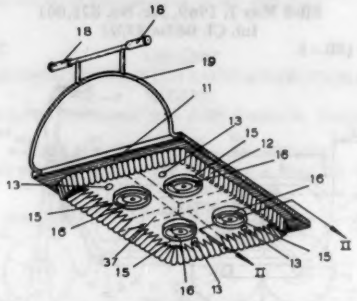
3,592,284
MOTORBICYCLE
Bernard Rene Mennesson, Neuilly-Sur-Seine, France, assignor to Societe D'Apparils De Controle Et D'Equipment Des Moteurs S. A. C. E. M., Neuilly-Sur-Seine, France
Filed Sept. 2, 1969, Ser. No. 854,445
Claims priority, application France, Sept. 30, 1968, 168,136
Int. Cl. B62k *11/00*
U.S. Cl. 180—33 **9 Claims**



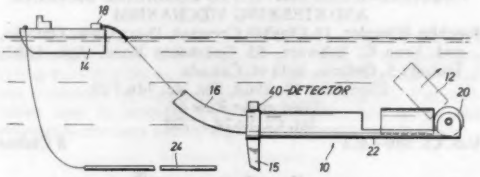
The rear-driving wheel of the motorbicycle is connected to the engine by a substantially horizontal transmission shaft. The engine is mounted in the frame by two transverse half-pivots whose axis passes substantially through the engine center of gravity. The engine is prevented from rotating around the half-pivots only by means of the transmission shaft. This transmission shaft extends freely between the engine output shaft and an input shaft providing a connection to the rear wheel, and is held in alignment with the engine output shaft and with the input shaft.

3,592,285
AIR CUSHION SUPPORTED PLATFORMS
Bruce Thomas Noble, Cowes, England, assignor to British Hovercraft Corporation Limited, Yeovil, Somerset, England
Filed Dec. 9, 1968, Ser. No. 782,297
Claims priority, application Great Britain, Mar. 8, 1968, 21688/68
Int. Cl. B60v *1/02*
U.S. Cl. 180—124 **8 Claims**

A load bearing platform of the air cushion supported type comprises a platform, a flexible skirting assembly adapted to restrict the escape of air from a cushion area beneath the platform, means for supplying pressurized air to the cushion area, and at least one platform lifting means carried by the platform, the lifting means being extendible to an operative position where it is adapted to support the platform until the supporting cushion is formed, and thereafter being retracted to an inoperative position. Exemplary lifting means comprise flexible inflatable diaphragms or pneumatically actuated wheels or rollers.



3,592,286
METHOD OF SEISMIC PROSPECTING
Curtis H. Johnson, San Marino, Calif., assignor to Western Geophysical Company of America, Houston, Tex.
Filed Sept. 11, 1969, Ser. No. 857,086
Int. Cl. G01v *1/00*
U.S. Cl. 181—0.5 **10 Claims**

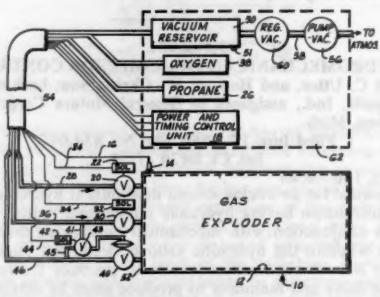


A method of seismic prospecting whereby explosive charges are detonated at any desired depth and the bubble-pulse train is permitted to form without hindrance.

In a first embodiment of the invention the effects of the bubble are removed in the stage of processing of the recorded seismic data.

In a second embodiment, the characteristic pulse train produced by the bubbles is used to enhance the quality of the resulting seismic data.

3,592,287
EXHAUST VALVE SYSTEM FOR SEISMIC GAS EXPLODER APPARATUS
John C. Mollere, San Marino, Calif., assignor to Western Geophysical Company of America, Houston, Tex.
Filed Apr. 7, 1969, Ser. No. 814,022
Int. Cl. G01v *1/04*
U.S. Cl. 181—.5 **16 Claims**



A seismic gas exploder having a combustion chamber for receiving a mixture of combustible gases and a remotely posi-

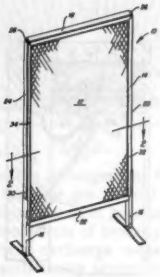
tioned vacuum chamber coupled to the combustion chamber. A remotely controllable, pilot-operated exhaust valve allows the products of combustion to purge into the vacuum chamber through the exhaust valve thereby achieving substantially greater efficiency and uniformity of operation. The pilot-operated exhaust valve is operated from a gas source forming part of the exploder fuel system.

3,592,288

ACOUSTICAL PANEL FOR FREESTANDING SPACE DIVIDER

Richard K. Walter, St. Paul, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed Sept. 6, 1968, Ser. No. 758,049
Int. Cl. E04b *1/86, 1/99;* **A47g** *5/00*
U.S. Cl. 181—30 **10 Claims**



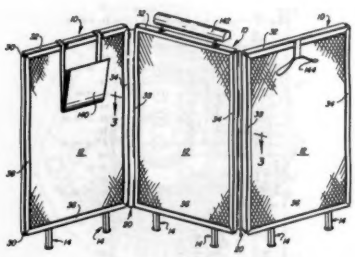
An acoustical panel is provided for a freestanding space divider which panel is resilient transverse to the major faces thereof in order to provide for easy insertion into the frame of the divider and further to provide for application of additional finishing sheets to the surface after insertion in the frame.

3,592,289

FREESTANDING ACOUSTICAL SPACE DIVIDER

James E. Aysta, Stillwater, and William H. P. Tacke, St. Paul, both of, Minn., assignors to Conwed Corporation, St. Paul, Minn.

Filed Sept. 6, 1968, Ser. No. 758,048
Int. Cl. E04b *1/86, 1/343, 1/99*
U.S. Cl. 181—30 **2 Claims**



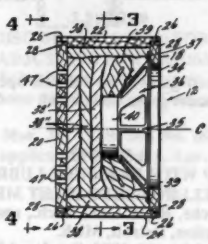
This invention relates to a freestanding acoustical space divider in which an acoustically absorptive panel is supported around its periphery by a metal frame assembled without the use of the usual fasteners such as screws or bolts and in which adjacent sections are flexibly connected by means of a plastic hingelike coupling strip. The coupling strip has enlargements along each of its longitudinal edges which fit into appropriately shaped grooves in the frame of the sections.

3,592,290

SPEAKER CABINET ENCLOSURE AND METHOD OF MAKING SAME

James C. Armstrong, 4017 Springrock Drive, Cincinnati, Ohio

Filed Nov. 21, 1967, Ser. No. 684,724
Int. Cl. G10k *13/00;* **H04r** *1/28*
U.S. Cl. 181—31 **10 Claims**



A speaker cabinet enclosure comprising a rectangular parallelepiped having a speaker unit in its front wall, a layer of insulation on each of its top, base and sidewalls, and a rear wall in which two sets of a plurality of apertures are disposed, each such set being a mirror image of the other in nature and disposition. Insulation is provided against the speaker unit frame above and below its magnet. A layer of insulation is provided directly behind the magnet of the speaker unit, and additional layers of insulation may be provided therebehind.

3,592,291

METHOD AND APPARATUS FOR SUPPRESSING THE NOISE AND AUGMENTING THE THRUST OF A JET ENGINE

George E. Medawar, San Diego, and Felix Hom, La Mesa, both of, Calif., assignors to Rohr Corporation, Chula Vista, Calif.

Filed Nov. 17, 1969, Ser. No. 877,408
Int. Cl. B64d *33/06;* **F01n** *1/14*
U.S. Cl. 181—33 HC **5 Claims**

Thrust gas of a jet engine is discharged through a lobed nozzle having apertures formed in the wall thereof at the crest of each lobe of the nozzle and at the bottom of each valley between the lobes. The apertures are in the form of flush inlet scoops so that slipstream air flowing past the nozzle enters said apertures and mixes with thrust gas flowing through the nozzle.

3,592,292

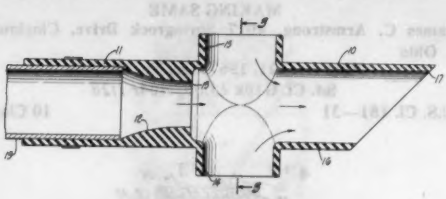
TAILPIPE EXTENSION SILENCER WITH VENTURI AIR EXTRAINMENT

James H. Lavallee, 2542 Front St., San Diego, Calif.

Filed June 24, 1970, Ser. No. 49,237
Int. Cl. F01n *1/08, 1/14, 7/20*
U.S. Cl. 181—51 **4 Claims**

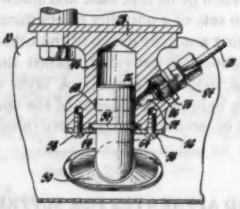
A tailpipe extension for vehicles with internal combustion engines is a one-piece tubular member having a venturi tube

portion formed therein and side openings immediately downstream from the waist of the venturi for inducting air to



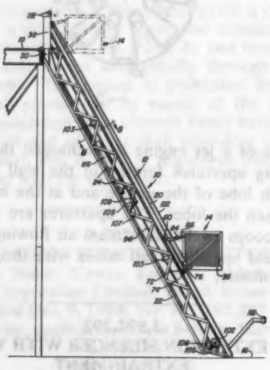
mix with the exhaust gases. The exhaust opening is cut at an angle to divert exhaust gases downward.

3,592,293
OIL PUMP WITH PRESSURE LUBRICATED SWIVELLING AUTO INLET MEANS
Frederick H. Frincke, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 12, 1970, Ser. No. 2,081
Int. Cl. F01m *11/06*
U.S. Cl. 184—6 B **6 Claims**



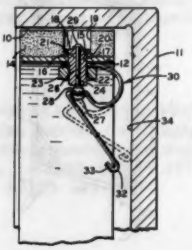
An engine oil pump system including a swivel-mounted oil pickup tube adapted to move with the movement of oil in the engine oil pan under severe operating conditions in which the swivel joint of the oil pickup tube is pressure lubricated with oil from the oil pump to improve swivel action and to prevent the intake of air through the swivel joint into the oil pump inlet.

3,592,294
ELEVATOR
Marion F. Allen, P.O. Box 3387, Odessa, Tex.
Filed Dec. 6, 1968, Ser. No. 781,943
Int. Cl. B66b *9/06*
U.S. Cl. 187—12 **4 Claims**



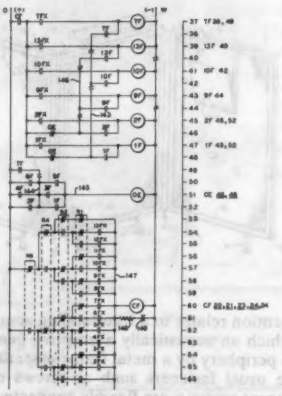
A construction elevator including an elongated structural framework incorporating a pair of laterally spaced tracks upon which a material and personnel carriage operates. The framework is adjustable so as to extend between the ground and a construction platform located at varying heights above the ground through a variation in the angle of the framework. The carrier is angularly adjustable on the framework so as to assume a horizontal positioning thereof regardless of variations in the angle of inclination of the framework. A counterweight unit is engaged with the carrier and mounted within the framework for track-guided movement therealong in a direction opposed from the direction of movement of the carrier so as to act as a counterbalance therefor. The carrier and framework are so orientated as to allow free access to and egress from the carrier at both ground level and at the construction platform.

3,592,295
WEAR SIGNALLING DEVICE FOR VEHICLE BRAKE LINING
Richard Kennel, 43-77 165 St., Flushing, N.Y.
Filed July 8, 1969, Ser. No. 839,897
Int. Cl. F16d *66/02*
U.S. Cl. 188—1 A **2 Claims**



A device for indicating wear of a brake lining on a brakeshoe which contacts a brakedrum including an elongated wire spring of C-shape with means at one end for attachment to the brakeshoe and as an angular extension at its outer end whose terminal contacts the brakedrum attached to a rotating vehicle wheel, to produce an audible signal. The device has means for retaining the ends close to each other under a bending stress to space the second end from said drum, and means to release the wire when the brake lining has worn to a predetermined minimum thickness.

3,592,296
ELEVATOR FLOOR SELECTOR CORRECTION CONTROL
Robert E. Senn, Toledo, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio
Filed Mar. 30, 1970, Ser. No. 23,795
Int. Cl. B66b *1/52*
U.S. Cl. 187—29 R **10 Claims**



Coincidence of true elevator car position with floor selector indicated car position is monitored at each stop of the

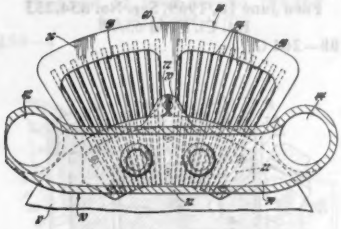
car. A lack of coincidence disables the control by the floor selector and causes it to institute hunting until it establishes coincidence with true elevator car position. Upon achieving coincidence hunting is stopped and its control reestablished.

3,592,297

DISC BRAKE COOLING

Charles B. Leffert, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 2, 1969, Ser. No. 838,518
Int. Cl. F16d *65/84*
U.S. Cl. 188—71.6 **5 Claims**



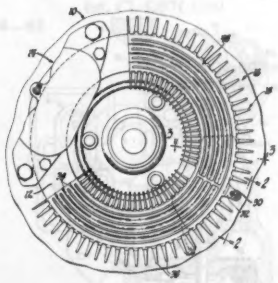
A disc brake cooling arrangement in which the rotating brake disc friction surfaces are in heat transfer contact with the evaporator section of a heat pipe arrangement. The heat transferred during low levels of braking is transmitted to ambient air or other heat exchange means by conduction and convection. When sufficiently severe braking loads occur so that the conduction mode of heat transfer will not carry away the heat at a sufficient rate, the heat pipe liquid is vaporized and builds up vapor pressure to bring the heat pipe into efficient operation. As the cooling system quickly shifts into this mode of operation the entire heat pipe assembly in effect suddenly increases its thermal conductivity by several orders of magnitude and the heat is rapidly carried away to the heat pipe condenser section, where it is then removed by a suitable heat exchanger arrangement. The heat pipe assembly is provided as a part of each disc brake pad assembly, and is replaceable with the pad.

3,592,298

BRAKE HEAT PIPE COOLING

Charles B. Leffert, Troy, and Lawrence R. Hafstad, Bloomfield Hills, both of, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 2, 1969, Ser. No. 838,583
Int. Cl. F16d *65/84*
U.S. Cl. 188—71.6 **4 Claims**



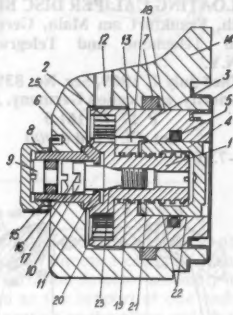
A brake-cooling system in which the rotating brake friction surfaces are in heat transfer contact with the evaporator section of a heat pipe arrangement. The heat transferred during low levels of braking is transmitted to ambient air or other heat exchange means by conduction and convection. When sufficiently severe braking loads occur so that the conduction mode of heat transfer will not carry away the heat at a sufficient rate, the heat pipe liquid is vaporized and builds up vapor pressure to bring the heat pipe into efficient operation. As the cooling system quickly shifts into this mode of operation the entire heat pipe assembly in effect suddenly increases its thermal conductivity by several orders of magnitude and the heat is rapidly carried away to the heat pipe condenser section, where it is then removed by a suitable heat exchanger arrangement.

3,592,299

HYDRAULIC DISC BRAKE ACTUATOR WITH A SELF-ADJUSTING MECHANISM

Hans Erdmann, Schonbornring, Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 21, 1969, Ser. No. 809,330
Claims priority, application Germany, Apr. 4, 1968, P 17 50 176.7
Int. Cl. F16d *65/56*
U.S. Cl. 188—71.9 **10 Claims**



A caliper-type disc brake actuator particularly suitable to automatic applications, which is operative in response to applied hydraulic pressure. A hollow-actuating piston located in an open-ended bore in a caliper housing is slidably mounted and obturated by a resilient "rollback" seal. A locknut or auxiliary piston of smaller diameter is coaxially and slidably located in the hollow actuating piston. Both the actuating piston and locknut are threaded to engage the threads of a coaxial spindle. A torsion spring operated to tend to rotate said spindle in a manner so as to cause its threads to abut against the threads of said actuating piston. This automatic adjustment presets the thread relationship thereby affording a close pad to disc spacing. A braking throw equal to the full axial thread play is available during the next braking action. A separate adjustment is provided for withdrawing the actuating piston for wear pad change, without opening the hydraulic system.

3,592,300

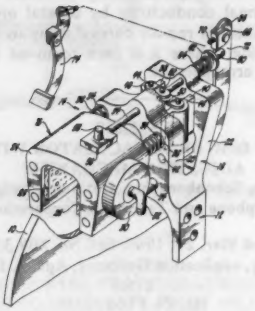
SELF-ENERGIZING DISC BRAKE

Thomas G. Thomas, Bedford, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1969, Ser. No. 872,963
Int. Cl. F16d *55/14*
U.S. Cl. 188—72.2 **4 Claims**

A disc brake is provided with primary and secondary friction-braking means, the brake reaction force from the primary friction-braking means acting through toggle arms to engage the secondary friction-braking means with the disc. The

actuating link which moves the toggle arms is also connected to be moved mechanically through a parking brake pedal to

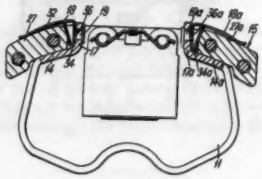


engage the secondary friction-braking means with the disc and thereby provide a mechanically actuated parking brake.

3,592,301
FLOATING CALIPER DISC BRAKE

Reinhard Auth, Frankfurt am Main, Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 7, 1969, Ser. No. 839,256
Claims priority, application Germany, July 11, 1968, P 17 75 161.0
Int. Cl. F16d *65/00*
U.S. Cl. 188—73.6 **16 Claims**

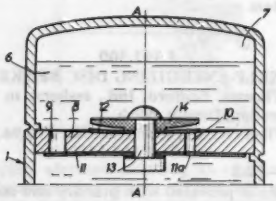


A floating caliper disc bake having a fixed U-shaped mounting frame adapted to fit around the edge of a rotatable brake disc and a brake-caliper assembly carried by the mounting frame and retained by means of springs so that the caliper assembly is relatively free to move in an axial direction while being resiliently restrained in the radial and peripheral directions.

3,592,302
TELESCOPIC SHOCK ABSORBERS

Fernand Stanislas Allinquant, 53, Avenue Le Notre, 92 Sceaux, France

Filed Dec. 6, 1968, Ser. No. 781,778
Claims priority, application France, Dec. 8, 1967, 131,615
Int. Cl. F16f *9/348*
U.S. Cl. 188—281 **2 Claims**

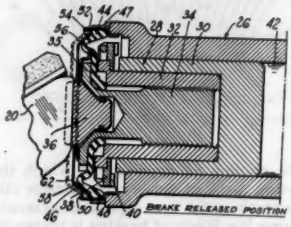


This invention relates to a telescopic hydraulic shock absorber in which flow of hydraulic fluid in the direction from the working chamber of the shock absorber to a compensating chamber through an apertured element is controlled by a flexible valve shim which opens by flexing under the effect of a fluid pressure differential in said direction, and is characterized by the provision of a profiled stop which first limits opening of the shim to an extent which presents only a relatively small fluid flow area and then permits flexing of an outer region of the shim to afford opening to a greater extent which presents a larger fluid flow area.

3,592,303
BOOT PROTECTOR

Burton M. Tincher, South Bend, Ind., assignor to The Bendix Corporation

Filed June 18, 1969, Ser. No. 834,253
Int. Cl. F16d *65/78*
U.S. Cl. 188—264 G **4 Claims**



A heat shield protects a flexible boot that closes the actuator housing of a wedge brake. The shield includes an annular wall portion that overlies the outer peripheral portion of the boot and a lip portion extending from the annular wall portion. A retainer carried by the housing receives the lip to hold the heat shield in place. The annular wall is divided into a plurality of relatively movable units to permit flexing of the shield as the plunger extends.

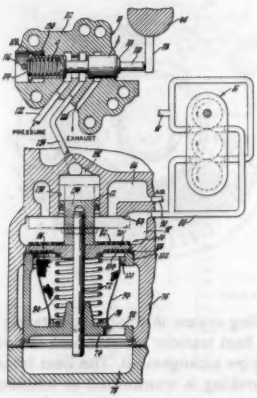
ERRATA

For Classes 190—49, 192—3, 192—12, 192—18 see: Patent Nos. 3,592,314 thru 3,592,318

3,592,304
FLUID DELIVERY CONTROL SYSTEM

Charles H. Thompson, Pittsboro, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 721,271, Apr. 15, 1968, abandoned.
Filed Apr. 3, 1969, Ser. No. 840,866
Int. Cl. F16d *65/78*
U.S. Cl. 188—264 P **2 Claims**



A fluid delivery control system is disclosed as controlling the delivery of coolant from a coolant pump to the output

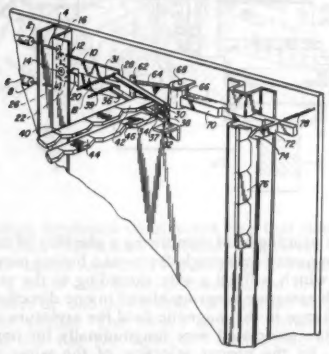
brake of a tracklaying vehicle. The control system according to the preferred embodiment has a pilot valve operated by the brake's apply linkage to control the operation of a fluid motor. The motor effects positive action of a check valve in the coolant pump's suction line to air bleed the pump to prevent coolant delivery to the brake during brake disengagement. The check valve is spring biased to connect the coolant pump's suction line to the pump's reservoir during brake engagement.

3,592,305

PRICE AND CREDIT SENSING ARRANGEMENT

Owen J. Schwertfeger, Chicago, Ill., assignor to Walter E. Heller & Company, Chicago, Ill.

Filed Sept. 12, 1968, Ser. No. 759,463
Int. Cl. G07f *11/00*
U.S. Cl. 194—2 **8 Claims**



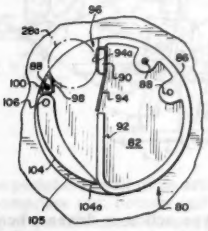
Apparatus for vending more than one article or service at specified credit levels includes an arrangement for preventing vending unless the proper credit is established and for preventing more than one vend at a time. An arrangement of credit levers permit displacement of a series of slidable members in response to operator selection when a proper credit has been established. The levers limit displacement of the slidable members to an extent such that only one selection is vended at a time.

3,592,306

ROTARY COIN MOVER WITH SIZE TESTER HAVING NORMALLY CLOSED BOTTOM

Lyman D. Dunn, Chicago, Ill., assignor to Marlan Company

Filed Dec. 12, 1969, Ser. No. 884,585
Int. Cl. G07f *5/00*
U.S. Cl. 194—61 **9 Claims**



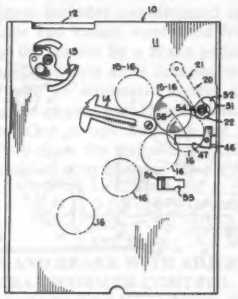
An improvement in a coin actuator for a vending machine of the type having a main rotor and a lock disc for preventing rotation of the main actuator rotor unless a coin of a predetermined value is received therein characterized by the provision of a bottomless coin receiving pocket and a swingable door thereunder so that coins of a smaller size than those intended for use with the machine will automatically drop through the actuating mechanism without the need for an externally actuated coin return mechanism and also, further characterized by the provision of a continuous substantially rigid peripheral tracking surface thereon so that coins in excess of the number of those which are intended to be received in the pocket for actuation of the mechanism will continue to ride about the periphery thereof during rotation of the mechanism and fall into the coin-receiving pocket on the next rotation after the first coin has advanced and cleared therethrough.

3,592,307

COIN SELECTING AND SEPARATING ASSEMBLY

Kenneth E. Hammond, Scarborough, Ontario, Canada, assignor to Coin Acceptors, Inc., St. Louis, Mo.

Filed Sept. 10, 1968, Ser. No. 758,745
Int. Cl. G07f *3/02*
U.S. Cl. 194—97 **13 Claims**



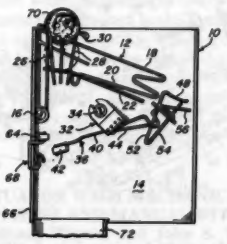
The selector assembly includes a support plate and a rail adjacent thereto which directs a coin into a serration detector assembly. The serration detector assembly includes a pendulum arm pivoted to the support at one end and having a rotatable balance portion at the other end. A sensing finger, rotatable with the balance portion, engages the serrations of milled coins and rotates the balance portion and the arm selectively, thereby directing milled coins into a different path from that taken by smooth-edged coins. A kick plate below the detector assembly further determines the paths of the coins.

3,592,308

COIN DISCRIMINATOR FORMED OF WIRE

Mitchell A. Hall, Ft. Thomas, Ky., assignor to Monarch Tool & Manufacturing Company, Covington, Ky.

Filed June 26, 1969, Ser. No. 836,792
Int. Cl. G07f *3/02*
U.S. Cl. 194—102 **18 Claims**



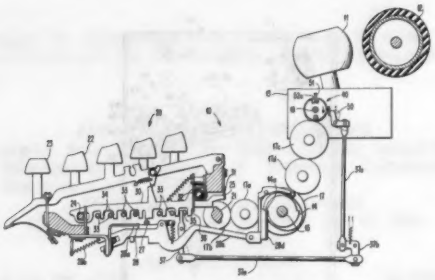
A magnetic field holds a pivotally mounted arm in a first position whereby the pivotally mounted arm has means to receive coins of a specific diameter and thickness from a wire runway or track. If the coin is of the weight of the coins to be directed to the selected area, the arm pivots away from its

receiving position to a position in which the coin is deposited in the selected area. A pivotally mounted retaining means, which has a different pivot axis than the arm, cooperates with the pivotally mounted arm to hold the coin, if it is of the desired weight, on the pivotally mounted arm until the coin is positioned by the arm for release to the selected area. At this time, The pivotally mounted retaining means has moved sufficiently relative to the pivotally mounted arm to cease to retain the coin on the pivotally mounted arm.

3,592,309
CYCLICALLY OPERABLE TYPEWRITER

James A. Craft, and John O. Schaefer, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1968, Ser. No. 781,790
Int. Cl. B41j *23/08*
U.S. Cl. 197—16 **7 Claims**

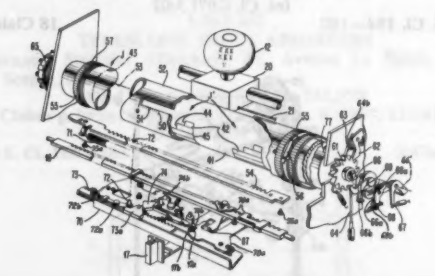


A typewriter constructed to operate in sequential cycles in performing both print and functional operations is provided with a normally engaged clutch operable to interrupt a print operation after its initiation whenever nonprinting functions are selected. Mechanism is provided for restoring the partially actuated print mechanism to a preset home position prior to initiation of a subsequent typewriter cycle.

3,592,310
JUSTIFICATION DATA CALCULATOR AND DISPLAY DEVICE

Walter O. Cralle, Jr., Georgetown; Joseph S. Morgan, Lexington, and Bernard E. Toben, Lexington, all of, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 19, 1966, Ser. No. 580,478
Int. Cl. B41j *19/58, 29/42*
U.S. Cl. 197—84 A **2 Claims**

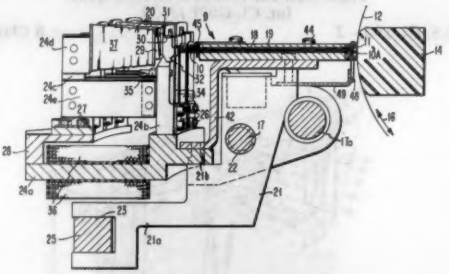


Spacing data for right-hand margin justification is graphically computed by a pair of intercooperating scales, one of which has biaxial color coded indicia, the other of which includes a uniaxial scale. The uniaxial scale is readable in conjunction with the biaxial color coding directly in terms of a justification problem solution. Also, a self-powered motion takeoff device is provided for automatically positioning one of the two scales by following motion of a typewriter letter feeding device within a predetermined proximity of the right margin.

3,592,311
WIRE PRINTING HEAD

Albert S. Chou, Monte Sereno, and Edgar A. Brown, Saratoga, both of, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 2, 1968, Ser. No. 764,474
Int. Cl. B41j *3/10*
U.S. Cl. 197—1 **13 Claims**

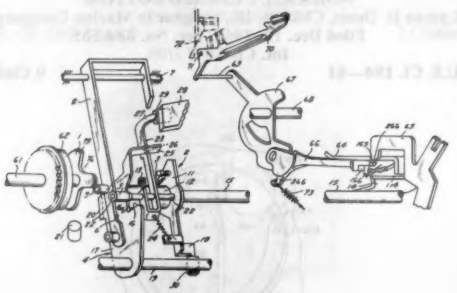


A wire printing head comprising a plurality of magnetic actuators mounted on a single frame and having movable armatures to which is fixed a wire extending to the record medium. Each armature is spring-biased in one direction such that with a change in the magnetic field the armature is moved to actuate the associated wire longitudinally for impacting the medium. By the proper selection of the wires actuated at each print position, characters are printed.

3,592,312
TYPE ACTION DRIVE

Kurt Chvatlinsky, Wilhelmshaven, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

Filed Aug. 13, 1969, Ser. No. 849,632
Claims priority, application Germany, Aug. 14, 1968, P 17 86 074.1
Int. Cl. B41j *23/08, 23/38, 7/02*
U.S. Cl. 197—14 **11 Claims**



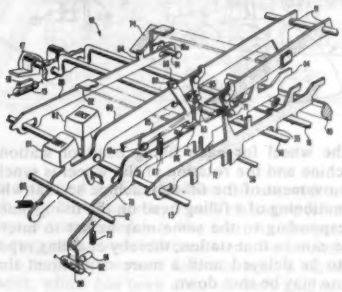
An actuated type action is driven when a spring biassed drive bar is released and moves about a first axis along a first circular path. When the drive bar is again wound up by a motor and engaged clutch, it is first displaced by a control cam about a second axis to a position spaced a smaller radius from the first axis whereupon it moves along a second circular path having a smaller radius than the first path so that the drive bar does not interfere with another type action actuated in the meantime.

3,592,313

ENCODING KEYBOARD HAVING DUAL-OUTPUT SHIFT KEY

William H. Castle, Winchester, and Donald L. Greer, Lexington, both of, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 15, 1968, Ser. No. 744,752
Int. Cl. B41j 25/24
U.S. Cl. 197—71 11 Claims



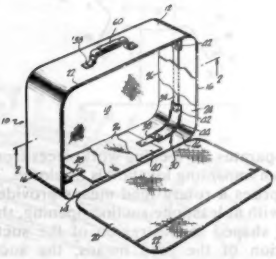
An encoding keyboard constructed like that disclosed in U.S. Pat. No. 3,086,635, entitled "Keylever Storage Mechanism," issued Apr. 23, 1963, to Leon E. Palmer is provided with a novel dual keylever construction that properly time-sequences up and down shift code entries with respect to character entries. The stroke storage provided in the keyboard of U.S. Pat. No. 3,086,635 is expanded to provide storage for two characters, when necessary, to accommodate the characteristically rapid and arhythmic, three-stroke sequence, "upshift-print-downshift."

3,592,314

FRAME FOR ARTICLE OF SOFT-WALLED LUGGAGE

Abraham J. Jacobson, 285 East 91st St., Brooklyn, N.Y.

Filed Aug. 19, 1969, Ser. No. 851,273
Int. Cl. A45c 13/36
U.S. Cl. 190—49 6 Claims



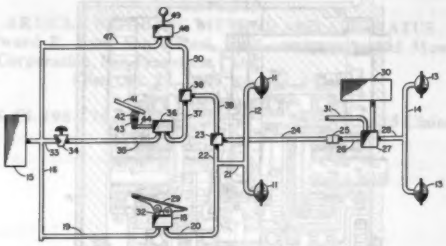
A frame for the peripheral wall of an article of soft-walled luggage, which comprises top, bottom and end walls of the article, consisting of prefabricated corner pieces each comprising end portions connected at right angles to one another and each portion having a debossment formed therein opening into its end edge wherein bands forming the top, ends and bottom of the frame may be set in and secured, as by rivets engaged through preformed registering openings in the bottoms of the debossments and in the ends of the bands; the debossments formed to accommodate the width and thickness of the band ends.

3,592,315

TRACTOR-TRAILER BRAKE SYSTEM

Henry B. Lewis, 2200 Gregory Lane, Waco, Tex.

Filed Nov. 20, 1969, Ser. No. 878,331
Int. Cl. F16d 67/00; B60t 13/26
U.S. Cl. 192—3 TR 12 Claims



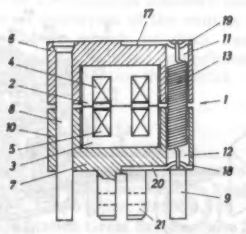
The brake system includes conventional air brake actuators for the tractor and trailer, controlled from a source of pressurized air in the tractor by a brake pedal actuated control valve. Reduced pressure air is directed to the trailer actuators only through an automatic system controlled by a valve coupled to the engine foot throttle linkage. This valve is normally closed, but is opened when the foot throttle is released to partially apply the trailer brakes. The system may also includes a manual control valve for applying the trailer brakes only.

3,592,316

CLUTCH AND BRAKE WITH ADJUSTABLE TRANSFORMER CONTROL

Heinz Daah, Darmstadt; Karl-Heinz Meier, Zeilhard Veher, Darmstadt, both of Germany, assignor to Quick-Rotan Becker & Notz, Darmstadt, Germany

Filed July 3, 1969, Ser. No. 838,931
Claims priority, application Germany, July 9, 1968, P 17 63 645.2
Int. Cl. F16d 67/06
U.S. Cl. 192—12 D 3 Claims



A speed-regulating unit for an electric motor drive connected in a system with electromagnetically actuated clutch and electromagnetically actuated brake members, wherein at least the clutch is rendered operative in response to a control voltage generated by means of the regulating unit. The unit is characterized by a variable transformer with a primary coil energized by an AC voltage, and a secondary coil supplying the control voltage. The coupling factor of the unit is adjustable to effect variable transformer action.

3,592,317

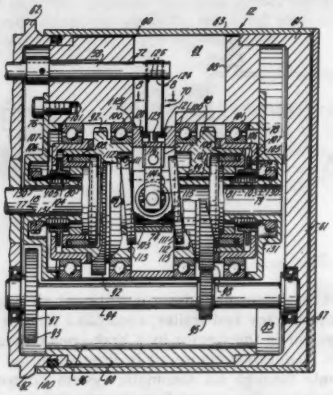
SERVO ACTUATOR WITH MECHANICAL POWER AMPLIFIER AND MANUAL BYPASS

Charles W. Chillson, Wayne, and John S. Perryman, Kinnelon, both of, N.J., assignors to Curtiss-Wright Corporation

Filed Oct. 20, 1969, Ser. No. 867,510
Int. Cl. F16d 67/02; B64c 13/04
U.S. Cl. 192—12 BA 9 Claims

The servo actuator has a signal input device for providing signals of relatively small magnitudes and a mechanical

power amplifier operably connected to the input device. The mechanical power amplifier is constructed and arranged to produce output forces of relatively great magnitude in response and proportional to the input signals for effecting

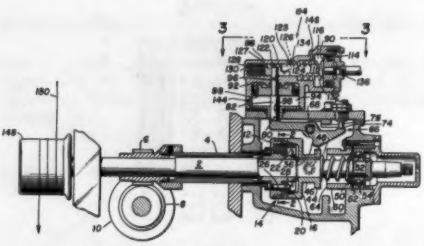


the actuation of an output mechanism. A means coacting with the signal input device is also provided for bypassing or overriding the mechanical power amplifier for automatically effecting direct manual actuation of the output mechanism when the power amplifier fails to operate properly.

3,592,318
FLUID PRESSURE-OPERATED OVERLOAD CLUTCH AND BRAKE

Glen E. Lyons; Douglas J. Lamb, and Paul T. Howse, Jr., all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 18, 1968, Ser. No. 784,560
Int. Cl. F16d *67/04, 43/20*
U.S. Cl. 192—18 **9 Claims**



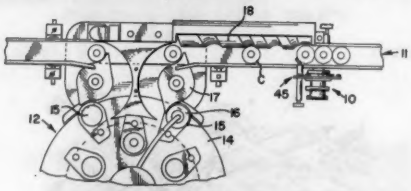
A clutch connected between drive and driven shafts and linked to an electropneumatic control unit to effect an automatic, positive disengagement of clutch members and a braking of the driven shaft when a predetermined drive shaft overload torque is sensed by the clutch. The clutch combines frictional and gear-tooth clutch components arranged to operate cooperatively and sequentially.

3,592,319
ARTICLE FEED CONTROL

Roy S. Rousseau, 1731 Fairmeadows Drive, Bettendorf, Iowa; John R. Doyle, 1214 N. Elmwood, Davenport, Iowa, and Gary F. Roberts, 3345 4th St., East Moline, Ill.

Filed Oct. 28, 1968, Ser. No. 770,971
Int. Cl. B23q *5/22, 7/00*
U.S. Cl. 198—19 **14 Claims**

An apparatus for incorporating in a container feedline for a container-filling machine which comprises a movably mounted can stop member adapted to be projected into the path of the cans advancing to the filling machine to momentarily hold back the cans, and a series of cams carried on a rotating disc or wheel which are manually settable on the wheel in either operative or inoperative position and which, in operative position, move the can stop member to can stopping position on each rotation of the wheel. There is a

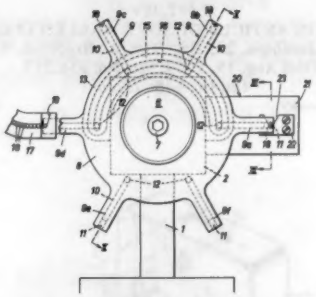


cam on the wheel for each filling head or station on the filling machine and the rotation of the wheel is synchronized with the movement of the filling machine so that when there is a malfunctioning of a filling head on the filling machine the cam corresponding to the same may be set to interrupt the feed of the cans to that station, thereby enabling repair or adjustment to be delayed until a more convenient time when the machine may be shut down.

3,592,320
APPARATUS FOR FEEDING WORKPIECES FROM A MAGAZINE TO A LASER BEAM IMPACTING LOCATION

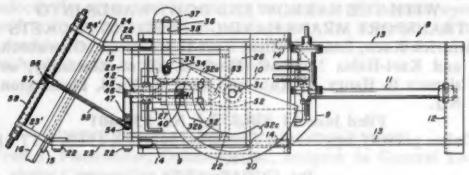
Hans Binggeli, Lerchenfeld B/Thun, Switzerland, assignor to Watch Stones Co. Ltd., Canton of Berne, Switzerland

Filed Dec. 30, 1969, Ser. No. 889,075
Claims priority, application Switzerland, Jan. 8, 1969, Jan. 8, 1969, 180/69;181/69
Int. Cl. B23q *5/22*
U.S. Cl. 198—19 **5 Claims**



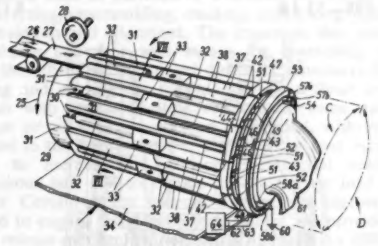
A novel apparatus for feeding workpieces from a magazine to a laser beam impacting location is disclosed. The novel apparatus comprises a rotary feed means provided on its bottom surface with at least one suction opening, the feed means being planar shaped in the region of the suction opening. During rotation of the feed means, the suction opening passes by the outlet of a magazine channel in which the workpieces, such as watch stones are held, the workpiece being sucked into the suction opening and retained on the rear planar bottom surface of the feed means. Further rotation of the feed means brings the workpiece to a stripping or wiping member whereat the workpiece is removed or stripped from the feed means and accurately positioned within a V-shaped holding notch disposed diametrically opposite the magazine with the feed means bridging the gap between the magazine and the holding notch. Subsequently, the now positioned workpiece is acted upon and perforated by means of laser pulses and then is removed from the notch. The feed means continuously rotates and thus, the transport operation proceeds smoothly, free of the deleterious effects of prior art oscillatory feeding operations.

3,592,321
WARE STABILIZER
Ronald M. Corbet, Knox, Pa., assignor to Glass Containers Corporation, Fullerton, Calif.
Filed Apr. 29, 1969, Ser. No. 820,170
Int. Cl. B65g 47/00
U.S. Cl. 198—24 6 Claims



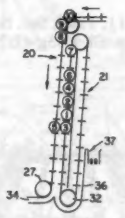
There is disclosed a ware stabilizer for use with a conventional push-type lehr loader by which glassware from a forming machine is transferred into the lehr. As the push bar of the loader engages a row of formed ware, on a suitable cross conveyor, to to push the ware into the lehr, a stabilizer bar on the loader, which has been clear of the ware, moves into contact with the upper portion of the glass articles to prevent them from falling forward. At the end of the pushing stroke the stabilizer bar swings in a limited vertical arc, insufficient to contact a previously loaded row of articles, clear of the ware just placed in the lehr, and then lifts with the pusher on which it is carried to clear the ware on the cross conveyor, and opens out to its starting position. A cam operated by the pusher in conjunction with a cam follower held against the caM by air cylinder controls the operation of the stabilizer bar.

3,592,322
APPARATUS FOR BRAKING AND HOLDING CIGARETTES OR THE LIKE
Ulrich Riegger, deceased, late of Hamburg, Germany (by Isle Riegger, sole heiress), assignor to Hauni-Werke Korber & Co. K.G., Hamburg-Bergedorf, Germany
Filed Mar. 6, 1968, Ser. No. 750,381
Claims priority, application Great Britain, Mar. 7, 1967, 10 659/67
Int. Cl. B65g 47/00, 17/46
U.S. Cl. 198—25 7 Claims



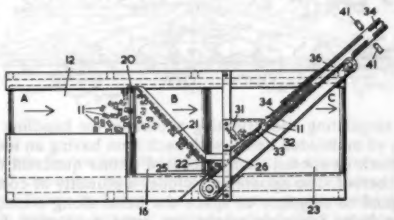
Cigarettes, filter rods, cigars, tobacco ropes or like rod-shaped bodies are decelerated and/or held against movement with reference to one or more supporting surfaces by electrostatic forces. Such forces are produced (a) by applying to the bodies an electrostatic charge of a given sign and thereupon placing the thus charged bodies into an electrostatic field produced by a charge of the same sign so that the field repels the bodies and presses them against a supporting surface, (b) by placing the bodies in contact with pairs of electrodes which are connected to different poles of an energy source so that the electrodes attract the bodies. The bodies may be braked while they travel axially, or such bodies may be held by electrostatic forces during lengthwise travel, during sidewise travel, or during a change in orientation.

3,592,323
ARTICLE-HANDLING METHOD AND APPARATUS
Edward E. Ross, San Rafael, Calif., assignor to Del Monte Corporation, San Francisco, Calif.
Filed Oct. 28, 1969, Ser. No. 871,863
Int. Cl. B65g 37/00
U.S. Cl. 198—76 15 Claims



A method and apparatus for handling various articles that are of comparable size and where the articles are received at a nonuniform rate. Two (i.e. first and second) conveying means are employed with paths of movement through a common transfer and accumulator region. In this region the articles are transferred in a random fashion from pockets of the first to pockets of the second conveying means. The transfer takes place at such a rate that all of the pockets of the second conveying means leaving the transfer region are filled whereby the second conveying means supplies the articles at a constant rate. The transfer region also serves as an accumulator in that a substantial number of articles are maintained in this region, thus accommodating substantial changes in the rate of supply of articles by the first conveying means without affecting the desired uniform rate of supply by the second conveying means. The embodiments disclosed include an apparatus making use of conveyors of the endless chain type, and apparatus employing wheels or discs having article receiving pockets. Also, one disclosed embodiment combines the accumulator means for orienting the articles.

3,592,324
FEEDING OF ARTICLES
Alan Caunt, Gainsborough, England, assignor to Rose Forgrove Limited, Gainsborough, Lincolnshire, England
Filed Nov. 7, 1969, Ser. No. 874,916
Claims priority, application Great Britain, Nov. 28, 1968, 56420/68
Int. Cl. B65g 47/24, 47/26
U.S. Cl. 198—30 5 Claims



The invention is concerned with apparatus for the feeding of articles of a rectangular, oval or other shapes having major and minor dimensions from a promiscuous mass into single

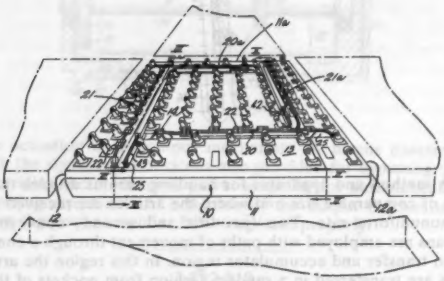
file relationship for forwarding to an apparatus for further manipulation of the articles, e.g., a wrapping machine, the apparatus consisting essentially of a succession of feeding bands driven at progressively higher linear speeds, a diagonal deflector plate arranged over an intermediate band to guide the articles towards one side of that band and a deflector belt arranged for movement diagonally of the next successive band with one lap constituting one side of a guide channel so as to guide the articles into the channel as they are received by the band.

3,592,325

MODULAR CONVEYOR UNIT

Norman M. Sullivan, and Francis J. Fitzgerald, both of Grand Rapids, Mich., assignors to Rapistan Incorporated, Grand Rapids, Mich.

Filed Apr. 11, 1969, Ser. No. 815,398
Int. Cl. B65g *47/26*
U.S. Cl. 198—31 **15 Claims**



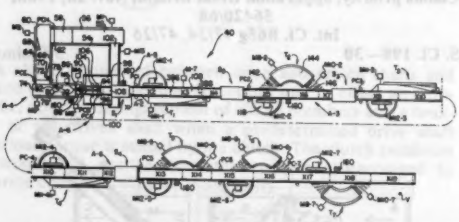
A modular conveyor unit wherein the powered means includes endless chains arranged in pairs, one pair being normal to the other, with the chains of each pair offset lengthwise with respect to each other so that the end of one chain is immediately adjacent one edge of the unit and the other is adjacent the other and the opposite end of each chain is spaced sufficiently from the opposite edge of the unit to permit a chain of the pair normal there to pass between it and the adjacent side of the unit.

3,592,326

PARCEL POST SINGULATING AND ORIENTING APPARATUS

Donald F. Zimmerle, Dayton; Horace W. Weeks, Bellbrook, and Robert E. Fischer, Dayton, all of, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Jan. 31, 1969, Ser. No. 795,588
Int. Cl. B65g *37/00*
U.S. Cl. 198—33 R **26 Claims**



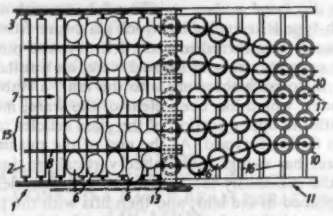
A singulating and orienting apparatus for handling a plurality of multisided items, with each item having an identifiable mark (a special stamp) located in one quadrant on one side thereof. The apparatus includes a plurality of conveyors designed to singulate or space the items along a main conveyor belt. Scanning means are used to search for the identifiable mark as the items are moved on said main belt. Conveyor-type manipulating means acting under control of signals from the scanning means rotate the items about their own horizontal and vertical axes, if necessary, so as to orient the side containing the mark in a predetermined orientation on the main belt. Optical quadrature scanning means then search the oriented side to locate the mark in a particular quadrant thereon, and, thereafter, the item is rotated about its horizontal axis, if necessary, to position the quadrant containing the mark in a particular orientation on the main belt. The scanning means are operated in "phosphorescent" and "fluorescent" modes to detect the identifiable mark.

3,592,327

DEVICE FOR ORIENTING EGGS AND BRINGING THEM WITH THE NARROW END DOWNWARDS INTO TRANSPORT MEANS HAVING RECEIVING POCKETS

Heinrich Koch, Bad Salzuflen; Kurt Hermsmeier, Obernbeck, and Karl-Heinz Northoff, Herford, all of, Germany, assignors to Henry Y. Kuhl and Paul R. Kuhl, Flemington, N.J.

Filed June 11, 1969, Ser. No. 832,401
Claims priority, application Germany, June 19, 1968, P 17 61 636.3
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 **3 Claims**



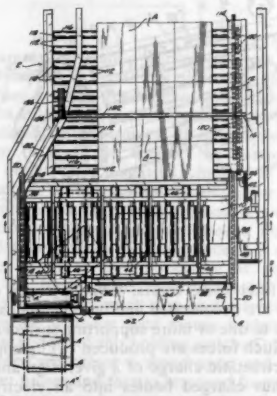
The invention relates to a device in which eggs are conveyed on a conveyor having a plurality of parallel rollers, all rotating in the same direction to a transport means having receiving pockets. Each egg is carried by two rollers and moves laterally to the conveying direction in the direction of its narrow end until it comes up against a lateral defining wall. The eggs are thus lined up according to the position of the narrow end and the air chamber end. Guide tongues are provided to reorient the eggs as they pass over a conveyor deflection roller so that they turn with their narrow ends pointing downwardly into the receiving pockets of the transport means.

3,592,328

TRANSFER AND ORIENTING MECHANISM FOR ARTICLES

Gordon K. Sapp, Middletown, Ky., assignor to Logan Co., Louisville, Ky.

Filed Dec. 3, 1969, Ser. No. 881,812
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AB **8 Claims**



A transfer and orienting means for articles such as cases, cartons, boxes and the like, comprising a live roller-type con-

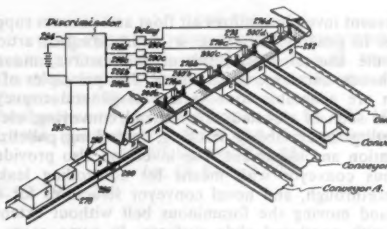
veyor defining a support and conveyance surface for the articles and means for feeding articles having a uniform axial orientation onto one end of the conveyor in a path of travel 90° to the longitudinal axis thereof, including a power-operated, rotatable feed drum disposed immediately alongside the conveyor in direct article-feeding relation thereto. The articles in passing from the drum onto the conveyor are urged by the thrust or force of the latter to a position of axial orientation 90° from the original orientation of the articles and by varying the speed of the articles as they move onto the conveyor by varying the drum speed the articles are selectively caused to accede to the action of the conveyor and to turn through 90° in passing onto the conveyor or to override the action of the conveyor and to pass thereonto without change in axial orientation.

3,592,329

DIFFERENTIAL PRESSURE CONVEYORS

Fred J. Fleischauer, Oakmont, Pa., assignor to General Logistics Corporation, Oakmont, Pa.

Division of Ser. No. 651,082, May 29, 1967, Pat. No. 3,477,588, which is a continuation-in-part of application Ser. No. 589,945, Oct. 27, 1966, now abandoned.
Filed Apr. 8, 1969, Ser. No. 814,342
Int. Cl. B65g 37/00
U.S. Cl. 198—81 **25 Claims**



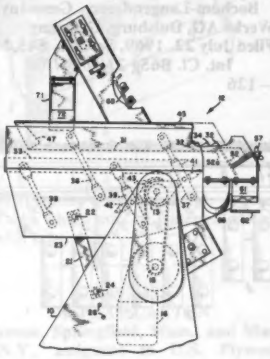
The present invention utilizes air float and vacuum support principles in general conveying or transporting of articles, without the use of high-differential pressures, movable vacuum heads, and large leakage rates. The principles of the invention are adaptable to a variety of general conveying operations such as elevated or overhead conveying, elevating, diverting, unscrambling, stacking, unstacking, palletizing, accumulation and alignment. The invention also provides a foraminous conveyor with means for controlling leakage rates therethrough, and novel conveyor structures for supporting and moving the foraminous belt without extensive contact with apertured slide surfaces. In some cases the vacuum or air lift conveyor can be hooded, with the hood coupled to the blower inlet or outlet as the case may be, in order to increase the pressure differential across the foraminous belt and to reduce the volumetric load on the blower. Certain of the vacuum conveyor arrangements are shaped to engage irregular objects and/or are provided with novel release mechanisms to quickly equalize the differential pressures across the belt in order to release articles adhered thereto. Novel mechanisms are provided for cleaning the foraminous belt for either vacuum or air lift conveyors described herein. When a variety of articles are transferred by the air lift or vacuum conveyor, a discriminator and time delay circuit can be associated therewith for discharging the conveyed articles selectively to preselected discharge stackers or cross-conveyors. Novel lateral seals are provided for sealing the edges of the foraminous belt to the pressure chamber in either of the air lift or vacuum conveyors. A novel depalletizers is eliminated, is associated with a lifting feature of the vacuum conveyors.

3,592,330

ARTICLE-FEEDING SYSTEM AND METHOD

Traver J. Smith, San Jose, Calif., assignor to Genevieve I. Hanscom, Saratoga, Calif. and Genevieve I. Hanscom, Robert Magnuson, and Lois J. Thomson, Trustees of the Estate of Roy M. Magnuson, part interest to each

Filed Feb. 20, 1969, Ser. No. 801,080
Int. Cl. B65g 37/00
U.S. Cl. 198—85 **6 Claims**



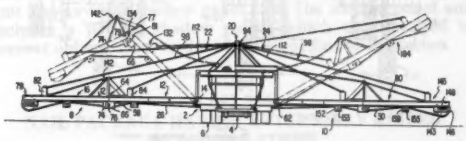
The present feed mechanism and method is designed to handle small articles such as frozen foods and deliver a desired quantity of the particular articles such as grapes, cherries, pineapple segments and the like for filling into a container. The feed system employs a shuffle feed mechanism which is slanted or tilted toward one side so as to provide continuous rows of articles against a stop formed by a sidewall of the shuffle feed mechanism. An adjustable divider or baffle member divides each row of articles as discharged from the shuffle feed mechanism, directing one part as a count of articles into a hopper for filling into a container. The remainder or other part of the articles of each row are returned to the shuffle mechanism adjacent the sidewall or stop for refeeding as a part of the articles to be filled.

3,592,331

WATERMELON HARVESTING MACHINE

Charles H. Morgan, R.F.D. #1 Box 153, Springfield, S.C.

Filed Dec. 31, 1968, Ser. No. 788,130
Int. Cl. B65g 37/00
U.S. Cl. 198—115 **13 Claims**



A mobile harvesting machine including a chassis with articulated conveyor frames mounted on opposite sides. Each conveyor frame includes inner and outer sections which are movable between laterally extended and folded positions. In order to accommodate for variations in terrain, the frames may be raised while the sections are extended and remain in substantial longitudinal alignment. A cable and pulley system supports each frame and controls its folding and terrain accommodating movement. A single feeding conveyor belt is

associated with each frame and has a concave cross section to cradle produce while transporting it to inclined conveyors on the chassis. The inclined conveyors include concave belts and flexible cleats that aid in moving the produce to a storage platform. A plurality of turning rollers are employed to transfer produce from the feeding belts to the inclined conveyors.

3,592,332

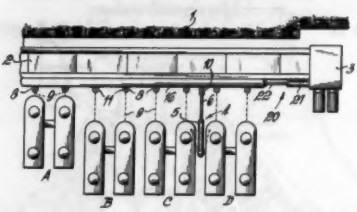
CONVEYOR DEVICE FOR MINING OPERATIONS AND ASSOCIATED CASING SUPPORT SYSTEM

Max Kuhn, Bochum-Langendreer, Germany, assignor to Klockner-Werke AG, Duisburg, Germany

Filed July 22, 1969, Ser. No. 843,445

Int. Cl. B65g *21/10, 41/00*

U.S. Cl. 198—126 **6 Claims**



The invention relates to a device provided for conveyor means in mining and serving for the butting or forward pressing devices for the conveyors and/or of units of the roof support casing system, said device having several bearings to which the units of the roof support systems respectively are connected at predetermined distances. These bearings on the one hand maintain somewhat the spacing of the units of the casing system and, on the other hand, they provide a sufficiently fixed connection with the conveyor, to which the units respectively may move up.

3,592,333

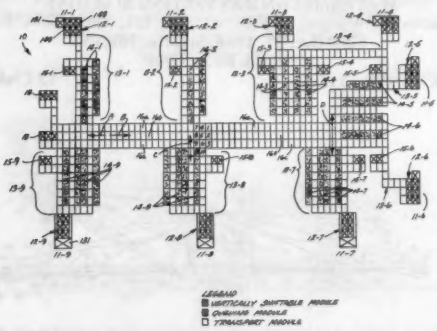
CARGO-HANDLING SYSTEM AND METHOD

Norman M. Sullivan, and Francis J. Fitzgerald, Jr., both of Grand Rapids, Mich., assignors to Rapistan Incorporated, Grand Rapids, Mich.

Filed Jan. 23, 1968, Ser. No. 703,514

Int. Cl. B65g *17/00*

U.S. Cl. 198—129 **41 Claims**



An article-transporting system made up of a large number of individual modules, each of which is a complete and independent conveyor within itself. Each module provides a low-friction article-supporting bed and powered means for forcibly moving the articles over this bed. Articles are moved from module to module in "start-stop" fashion. The functioning of the entire system is integrated by a control system which selectively regulates the operation of the individual modules to function in cooperation with one module at one time and other modules at other times. The modules have a minimum operating capability of two opposite directions and in many cases have a four directional operating capability. The entire system is capable of reorganization and expansion by the addition, deletion, or relocation of modules.

3,592,334

DIFFERENTIAL PRESSURE CONVEYORS

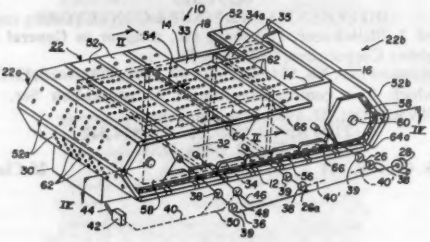
Fred J. Fleischauer, Oakmont, Pa., assignor to General Logistics Corporation, Oakmont, Pa.

Division of Ser. No. 651,082, May 29, 1962, Pat. No. 3,477,558, which is a continuation-in-part of application Ser. No. 589,945, Oct. 27, 1966, now abandoned.

Filed Apr. 9, 1969, Ser. No. 814,784

Int. Cl. B65g *15/00*

U.S. Cl. 198—184 **22 Claims**



The present invention utilizes air float and vacuum support principles in general conveying or transporting of articles, without the use of high differential pressures, movable vacuum heads, and large leakage rate. The principles of the invention are adaptable to a variety of general conveying operations such as elevated or overhead conveying, elevating, diverting, unscrambling, stacking, unstacking, palletizing, accumulation and alignment. The invention also provides a foraminous conveyor with means for controlling leakage rates therethrough, and novel conveyor structures for supporting and moving the foraminous belt without extensive contact with apertured slide surfaces. In some cases the vacuum or air lift conveyor can be hooded, with the hood coupled to the blower inlet or outlet as the case may be, in order to increase the pressure differential across the foraminous belt and to reduce the volumetric load on the blower. Certain of the vacuum conveyor arrangements are shaped to engage irregular objects and/or are provided with novel release mechanisms to quickly equalize the differential pressures across the belt in order to release articles adhered thereto. Novel mechanisms are provided for cleaning the foraminous belt for either vacuum or air lift conveyors described herein. When a variety of articles are transferred by the air lift or vacuum conveyor, a discriminator and time delay circuit can be associated therewith for discharging the conveyed articles selectively to preselected discharges stackers or cross conveyors. Novel lateral seals are provided for sealing the edges of the foraminous belt to the pressure chamber in either of the air lift or vacuum conveyors. A novel depalletizer including a horizontally movable delivery plate having an inclined edge is associated with a vacuum conveyor and with an alignment conveyor. Another novel depalletizer, wherein the indexing requirement of conventional depalletizers is eliminated, is associated with a lifting feature of the vacuum conveyor.

3,592,335

CONVEY FOR CYLINDRICAL PARTS

Howard M. Meyer, Ypsilanti, Mich., assignor to General Motors Corporation, Detroit, Mich.

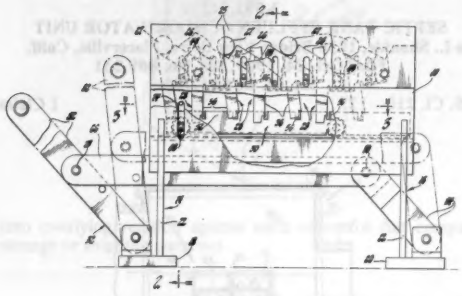
Filed Nov. 25, 1969, Ser. No. 879,839

Int. Cl. B65g *25/04*

U.S. Cl. 198—219 **3 Claims**

A conveyor for moving individual cylindrical members along an axis substantially perpendicular to the longitudinal axis of the parts. The conveyor includes a pair of parallel baseplates having a series of axially spaced notches for supporting the cylindrical parts. A series of carrier members are

supported between the baseplates and have a first portion located below one of the notches and a second portion extending into an axially adjacent notch. A drive member is provided for raising the carrier member so that the first portion will move a cylindrical part to an axially adjacent notch

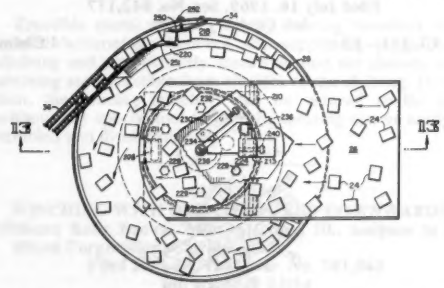


when the latter is unoccupied. When the axially adjacent notch supports a cylindrical part, the latter actuates the second portion of the carrier member thereby causing disengagement between the drive member and the carrier member to prevent raising of the first portion.

3,592,336
VIBRATORY POWER-DRIVEN CONVEYOR

Franklin J. Thurston, Hartford, and Joseph M. Nazali, West Hartford, both of, Conn., assignors to Kaman Aerospace Corporation, Bloomfield, Conn.

Continuation-in-part of application Ser. No. 595,447, Nov. 18, 1966, now Patent No. 3,456,424. This application May 5, 1969, Ser. No. 821,932
Int. Cl. B65g *27/00*
U.S. Cl. 198—220 **2 Claims**



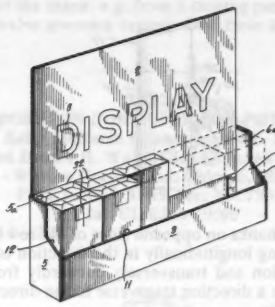
An article-handling apparatus is provided with an article-feeding means to feed individual articles, such as candies or other objects, to a transfer arm which places each article onto a conveyor. The article-feeding means is provided with a vibrating tray and bowl combination which feed and orient the articles.

3,592,337
DISPLAY CARTON

Floyd L. Phillips, Jr., Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Nov. 12, 1969, Ser. No. 875,788
Int. Cl. B65d *5/50*
U.S. Cl. 206—44 R **8 Claims**

A display carton having an open-topped frame to enclose articles to be displayed, with a display panel extending upwardly from the backside of the frame. The blank for forming the carton is cut so that the upwardly extending display panel is formed as part of the front panel, but is folded back and overlaps part of the back panel when the carton is set up, so that the back panel reinforces the display panel. The blank

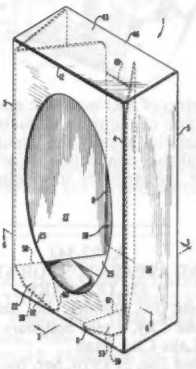


is foldable so that it may be shipped flat. A modification has projecting end tabs which may be fastened down to an underlying surface with tape.

3,592,338
DISPLAY CARTON

Wallace E. Hanson, Springfield, Mass., and Mario A. Isoldi, Brooklyn, N.Y., assignors to U.S. Plywood-Champion Papers Inc., Hamilton, Ohio

Filed Aug. 15, 1969, Ser. No. 850,431
Int. Cl. B65d *25/00*
U.S. Cl. 206—45.19 **8 Claims**



A display carton consisting of a shadow box made of one piece of sheet material having a plurality of serially connected panels that form an outer generally rectangular box unit and an inner shadow panel unit. The shadow panel unit includes a pair of shadow panels which are arranged to present oblique faces to the window opening in the carton.

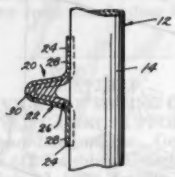
3,592,339
NAIL PACKAGE HAVING EXTERIORLY RIBBED RETAINING STRIPS

Peleg B. Briggs, Jr., Mystic, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Nov. 14, 1969, Ser. No. 876,810
Int. Cl. B65d *83/00*
U.S. Cl. 206—56 D **11 Claims**

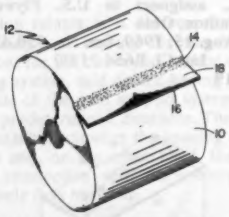
A nail package of the type including a plurality of nails arranged in row formation with their shanks generally parallel and the heads of adjacent nails in lapped relation and a plurality of strips of material for securing the nails in the row formation operable to be progressively disintegrated as the nails are progressively driven from the row formation by a tool. Each of the strips is formed to provide relatively nar-

row, thin, elongated webs and a longitudinally coextensive central rib, the webs extending longitudinally in the direction of extent of the row formation and transversely in the direction of extent of the shanks and being adhesively



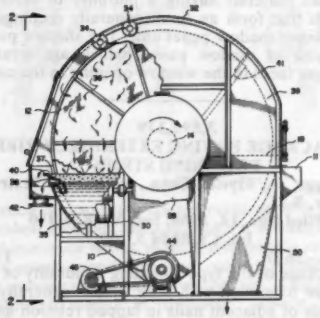
secured to the shanks on opposite sides of the row formation, the ribs extending longitudinally in the direction of extent of the row formation and transversely outwardly from the associated webs in a direction transverse to the direction of extent of the shanks.

3,592,340
ROLL OF THERMOPLASTIC MATERIAL
Raymond M. Hoey, Barrington, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Sept. 4, 1969, Ser. No. 855,255
Int. Cl. B65d *85/66*
U.S. Cl. 206—59 **6 Claims**



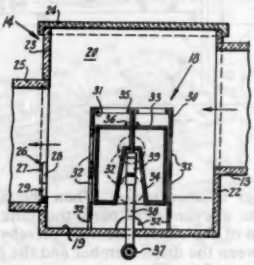
An elongated strip of thermoplastic material wound into a roll having a portion of the roll's ultimate convolution fused solely by strip material to only the penultimate convolution to provide a breakable connection therebetween which will break, to release the strip for unwinding, before the strip material tears.

3,592,341
METHOD AND APPARATUS FOR STEAM DRYING FILTER CAKE
Robert C. Emmett, Jr., Dundee, Ill., and Donald A. Dahlstrom, Salt Lake City, Utah, assignors to Envirotech Corporation, Salt Lake City, Utah
Filed Jan. 5, 1970, Ser. No. 692
Int. Cl. B01d *37/00*
U.S. Cl. 210—68 **12 Claims**



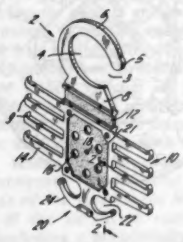
A method and apparatus is disclosed for steam-drying filter cake formed on a drum on disc-type vacuum filter which is mounted for rotation in an enclosed feed slurry tank. To block heat loss and subsequent condensation of the steam within the enclosed area, an insulating barrier is floated on the feed slurry to maintain a thermal separation therebetween.

3,592,342
SEPTIC TANK EFFLUENT CHLORINATOR UNIT
Joe L. Shankle, 1030 Bridge View Drive, Placerville, Calif.
Filed Oct. 24, 1969, Ser. No. 869,231
Int. Cl. B01d *57/00*
U.S. Cl. 210—127 **1 Claim**



A chlorinator unit for the effluent of a septic tank in which a flow restrictor in the distributor box maintains a head of effluent and as the head rises a float actuated valve is opened to emit chlorinated water into the distributor box to mix with the effluent prior to its moving on to the septic tank field.

3,592,343
TRAVEL TIE HANGER
James B. Swett, Barrington, R.I., and Sidney Z. Smith, Worcester, Mass., assignors to Dart Industries, Inc., Los Angeles, Calif.
Filed July 16, 1969, Ser. No. 842,177
Int. Cl. A47j *51/24*
U.S. Cl. 211—13 **4 Claims**

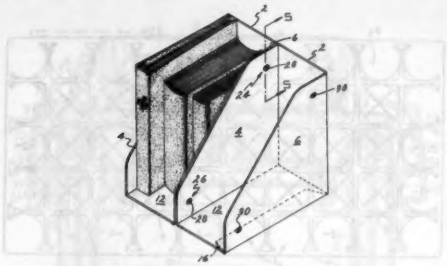


A travel tie hanger constructed in a manner to provide a convenient and accessible means of storage for not only neckties, but also cuff links, tie tacks, belts, tie clasps and other men's clothing accessories.

3,592,344
COLLAPSIBLE SECTIONAL BOOKCASE UNIT
Frank Stanley Schade, Holyoke, Mass., assignor to National Blank Book Company, Inc., Holyoke, Mass.
Filed Dec. 26, 1968, Ser. No. 787,186
Int. Cl. A47b *63/00*
U.S. Cl. 211—42 **3 Claims**

A collapsible folding bookcase construction for separate desk or tabletop use and as a sectional unit to be releasably assembled with like units, a foldable unit having hinged back, side, and bottom panels and an assembly or connector flap,

the side panels having recessed fastener means for joining like units side-by-side and the panels and flap being foldable



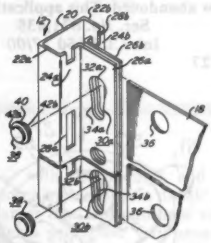
into overlying relation against each other for flat compact storage or shipping purposes.

3,592,345

ERECTIBLE METAL SHELVING

Bernard E. Featherman, Philadelphia, Pa., assignor to Bernard Franklin Company, Inc., Philadelphia, Pa.

Filed Apr. 4, 1969, Ser. No. 813,654
Int. Cl. A47b *9/14*; A47f *5/10*
U.S. Cl. 211—176 **4 Claims**



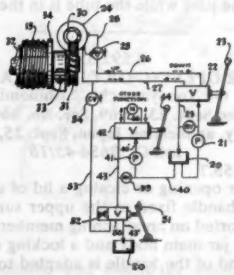
Erectible metal shelving having bracing members which extend horizontally between the supporting posts of the shelving and are relatively narrow so that the shelves of the shelving are accessible from all sides of the shelving. In addition, the bracing members can be secured to the posts without any special tool so that the shelving can be easily assembled and disassembled.

3,592,346

WINCHING WITH GREATER SPEED DOWNWARDLY

Wilburn Kelly Brown, Morton Grove, Ill., assignor to Pettibone Corporation, Chicago, Ill.

Filed June 28, 1968, Ser. No. 741,048
Int. Cl. B66c *23/54*
U.S. Cl. 212—31 **4 Claims**



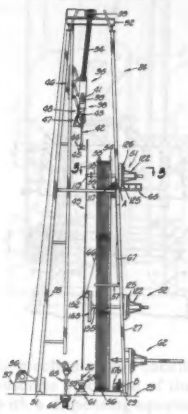
In a hydraulic crane in which the line or winch speed is usually limited by the output of a positive displacement hydraulic pump, a faster speed downwardly is provided by a valve (preferably foot controlled) which will add to the normal flow in the "down" hydraulic conduit additional fluid from a supplemental source of supply which may be one not always available. The hydraulic fluid provided for another function of the crane, e.g. from a slewing pump, can be used. A check valve prevents reverse flow from the "down" conduit.

3,592,347

PIPE POSITION INDICATOR FOR PIPE RACKERS

Robert R. Kelly, Hoffman Estates; James R. Tomashek, Wood Dale, and Donald H. Ward, Glen Ellyn, all of, Ill., assignors to Borg - Warner Corporation, Chicago, Ill.

Filed Jan. 13, 1969, Ser. No. 790,643
Int. Cl. E21b *19/00*
U.S. Cl. 214—2.5 **11 Claims**



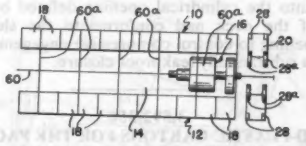
A pipe position indicator for pipe rackers, in which the position of a stand of pipe is shown for each of two axes on a pair of dials, one of which dials shows gross positioning and the other of which dials shows fine positioning, with respect to the well centerline and the racked positioned of the pipe stand.

3,592,348

LOAD CARRIER-LOAD SUPPORT MECHANISM IN AUTOMATIC WAREHOUSING SYSTEM

Wayne G. Atwater, Willoughby, Ohio, assignor to The Triax Company, Cleveland, Ohio

Filed Nov. 10, 1969, Ser. No. 875,474
Int. Cl. B65g *1/06*
U.S. Cl. 214—16.4 A **15 Claims**



An automatic warehousing system including a load carrier movable horizontally and vertically in a travel zone for depositing loads into and removing loads from a storage rack, with other load support structure coacting with the travel zone for supporting one or more loads in position to be handled by the load carrier for transmittal to the storage rack. The load carrier includes a cantilever section on which is mounted an extensible load-handling device or extractor. In one embodiment, the other load support structure comprises opposing pickup and discharge station structures having means thereon for supporting a load between the two sta-

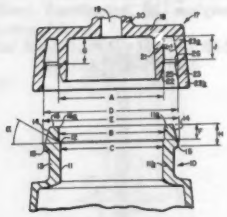
tions, with the cantilever section and load-handling extractor being adapted to be received in nested relation between the two stations for handling loads supported between said two stations as well as loads supported solely on one station. In another embodiment the other load support structure comprises a conveyor mechanism having a cutout section in which the cantilever section and load-handling extractor are adapted to nest, with a load being adapted to be positioned above said cutout section, for handling by the load carrier upon raising of the extractor thereof.

3,592,349

PLASTIC CONTAINER AND CLOSURE

William A. Baugh, Overland Park, Kans., assignor to Ethyl Development Corporation, Kansas City, Mo.

Filed May 22, 1969, Ser. No. 826,952
Int. Cl. B65d *41/22, 1/02*
U.S. Cl. 215—41 **9 Claims**



A container and a plastic closure therefor which provides an essentially leakproof seal. The container has an opening surrounded by a continuous sidewall defining a cylindrical neck opening at its outer end. The cylindrical opening defined by the sidewall is provided with an annular band of increased diameter adjacent its upper end. In the preferred form a closure cap for the container neck is provided which has an integrally formed, depending outer skirt providing a retention groove on the interior surface thereof. The closure cap is provided with an inner, coaxial, depending annular skirt attached to the underside of the top of the cap and spaced inwardly from the outer skirt. The inner skirt is of generally annular configuration, has a diameter slightly larger than the maximum diameter of the cylindrical neck opening and is of sufficient resiliency to conform to the interior wall of the continuous sidewall of the container neck. When the cap is snapped onto the container neck, the inner skirt is squeezed into the cylindrical opening defined by the inner sidewall of the neck and conforms to the shape of the stepped opening to control compressive engagement thereby providing a substantially leakproof closure.

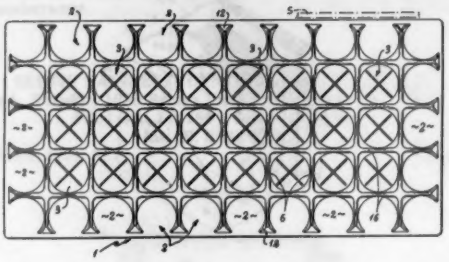
3,592,350

MOLDED-PLASTIC CARTONS FOR THE PACKAGING OF SMALL FRAGILE OR FLABBY FILLED SEALED CONTAINERS SUCH AS BOTTLES AND THE LIKE

Guido Martelli, Piazza XX Settembre 5; Nerio Martelli, Via Cavaioni 6, and Francesco Martelli, Piazza XX Settembre 5, all of Bologna, Italy

Filed Apr. 30, 1969, Ser. No. 820,368
Claims priority, application Italy, May 8, 1968, 7,010 A/68
Int. Cl. B65d *25/02, 81/00*
U.S. Cl. 217—19 **6 Claims**

Cellular cartons to be inserted in packaging boxes, for the packaging of bottles and manufactured by molding of thermoplastic material have peripheral cells provided with bottom sheets on which the bottles rest and inner cells having their lower ends permitting the through passing of the bottle ends, whose bottoms rest upon the bottom of the packaging box. The bottles inserted in the peripheral cells serve for anchoring the cartons in the packaging boxes.

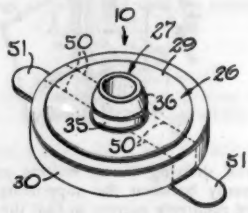


3,592,351

CONTAINER CLOSURE

Arthur L. Johnson, Jr., Rockford, and Marlow W. Dodge, Loves Park, both of, Ill., assignors to Johnson Enterprises, Inc., Rockford, Ill.

Continuation-in-part of application Ser. No. 660,265, Aug. 14, 1967, now abandoned. This application Sept. 23, 1969, Ser. No. 871,435
Int. Cl. B65d *17/00*
U.S. Cl. 220—27 **16 Claims**



For enabling cleaning, filling, and tapping of a container of pressurized liquid such as a barrel of draft beer through a single opening in the barrel, a closure unit covers and closes a relatively large filling and cleaning opening in the barrel The unit comprises a removable main closure sized and shaped to close more than one-half the total cross-sectional area of the opening and a separate rubber sealing plug fitted snuggly into a hole in the main closure, the sealing plug being adapted to receive a tube of a dispensing device for withdrawing beer from the barrel The sealing plug is formed with a rubber membrane which closed the hole and seals the barrel until the barrel is tapped and which then becomes punctured and seals around the tube while the tube is in the barrel.

3,592,352

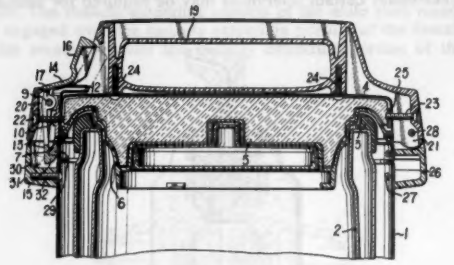
DEVICE FOR OPENING OR CLOSING A LID OF A JAR

Nobuo Shirae, 6-4 Tonoyamacho, Nishinomiya, Hyogo, Japan

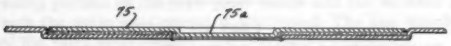
Filed Sept. 23, 1969, Ser. No. 860,382
Claims priority, application Japan, Sept. 25, 1968, 43/83584
Int. Cl. B65d *45/18*
U.S. Cl. 220—55.7 **1 Claim**

A device for opening or closing a lid of a jar in which the tail end of a handle fixed to the upper surface of the lid is hingedly supported on an attaching member at the upper rear portion of the jar main body and a locking member mounted at the front end of the handle is adapted to be engaged with or disengaged from a holding member at the upper front portion of the main body. After the locking member is fixed to the outer cover of the lid, the handle is mounted on the outer cover. The handle and the locking member are constructed

independently of each other in their mechanical structures, whereby the load to be exerted on the handle due to its structure is reduced to make the device more durable and easier to assemble.



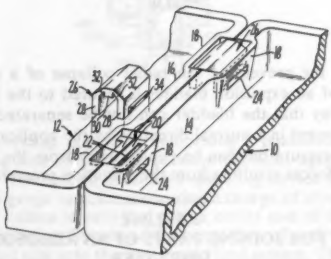
3,592,353
SEALING PATCH FOR EVAPORATED MILK CANS
Eldred W. Bowen, Brentwood, Mo., assignor to Pet Incorporated, St. Louis, Mo.
Division of Ser. No. 634,280, Apr. 27, 1967, Pat. No. 3,517,476. Filed Sept. 2, 1969, Ser. No. 868,261
Int. Cl. B65d 7/42
U.S. Cl. 220—66 **5 Claims**



A can end closure with fill opening and a foil patch secured over said opening by means of a plastic adhesive.

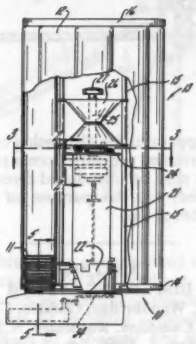
The filler hole is larger than conventional and the profile of the can lid includes a protective wall around the filling opening defining a well into which the seal is placed to protect it from accidental removal. The principal purpose of the invention is to eliminate the use of solder in covering the filling opening which in the past occasionally has resulted in pellets of solder being deposited in the contents of the can.

3,592,354
HINGE CONSTRUCTION FOR TWO-PIECE CONTAINERS
Elmer T. Nielsen, 155 Paraiso Place, San Francisco, Calif.
Filed Nov. 3, 1969, Ser. No. 873,212
Int. Cl. B65d 51/04; E05d 1/02
U.S. Cl. 220—315 **2 Claims**



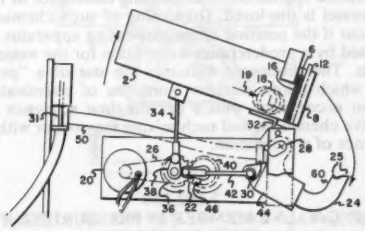
An internally located and essentially out-of-sight hinge construction for a two-piece container, each of the container pieces having a pair of hinge sockets provided with locking slots, the adjacent hinge sockets of the container pieces being interconnected by one-piece flexible plastic hinge straps having at the ends thereof wedgelike protuberances adapted to be engaged with the locking slots. The hinge straps are provided with wall sections of minimal thickness constituting a pair of spaced, parallel hinge lines about which the respective integrated portions of each strap move relative to each other to permit opening and closing of the two-piece container through an angle somewhat in excess of 180°.

3,592,355
DISPENSING DEVICE WITH ROTATABLE TURRET
Marvin R. Manzer, and Donald E. Schmitt, both of Rockford, Ill., assignors to Reed Electromech Corp., Rockford, Ill.
Filed Dec. 8, 1969, Ser. No. 883,197
Int. Cl. G07f 11/12
U.S. Cl. 221—11 **12 Claims**



A positive acting mechanism for backing up a rotating turret of a cup dispenser to place one of the cupholders on the turret in registry with a dispensing opening in the base of the dispenser after the turret has been indexed to move the holder toward and then partially past the opening. The forward indexing of the turret allows the lowermost cups of a stack of nested cups in the holder to drop into the opening, and the backing up of the turret shifts the cups stacked in the holder into accurate alignment with the cups dropped intc the opening.

3,592,356
APPARATUS FOR AUTOMATICALLY DIFFERENTIATING AND FEEDING FLEXIBLE WORKPIECES ONE AT A TIME FROM A STACK
Herman Rovin, East Norwalk, Conn., assignor to Ivanhoe Research Corporation, New York, N.Y.
Filed May 6, 1969, Ser. No. 822,270
Int. Cl. B65h 1/08, 3/08; B65g 59/04
U.S. Cl. 221—36 **9 Claims**

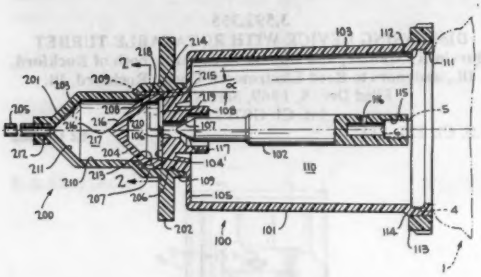


A hopper holds a stack of workpieces which are fed to a discharge mouth at one end of the hopper by intermittent pressure feed means, a movable suction head located near the discharge mouth, through which suction is applied, withdraws the end pieces, one at a time, from the stack away from the discharge mouth (at time intervals) during cycles of operation when the intermittent feed means relieves the pressure applied to the stack.

3,592,357
METHOD AND APPARATUS FOR DISPENSING CONTROLLED VOLUMES OF GAS

Ralph A. Welch, 2470 Lane Road, Columbus, Ohio

Filed May 14, 1968, Ser. No. 729,027
Int. Cl. G01f *11/28*
U.S. Cl. 222—1 24 Claims

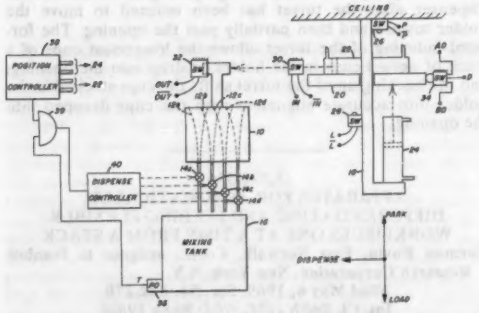


A method and apparatus for dispensing controlled volumes of gas at a predetermined pressure from a pressurized source. The dispensed gas may be introduced directly into a material-receiving chamber for the purpose of mixing with and ejecting material therefrom.

3,592,358
DISPENSING SYSTEM

George P. Lugsdin, Woodbridge, Ontario, Canada, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1969, Ser. No. 846,714
Int. Cl. B67d *3/00*
U.S. Cl. 222—52 7 Claims



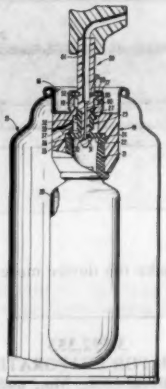
Articulated apparatus for dispensing chemicals, or the like, into a vessel is disclosed. Dispensing of such chemicals can only occur if the position of the dispensing apparatus is complemented by a predetermined condition for the vessel, or its contents. The disclosure indicates the use of a "program" circuit which allows various quantities of chemicals to be mixed in accordance with a certain time sequence for the respective chemicals; and such mixing may occur without the attendance of a technician.

3,592,359
SPRING-VALVE MEMBER IN PRESSURIZED TWO FLUID DISPENSER

Leonard L. Marraffino, 884 NE 42nd St. Oakland Park, Fort Lauderdale, Fla.

Filed May 27, 1969, Ser. No. 828,203
Int. Cl. B65d *83/14*
U.S. Cl. 222—94 5 Claims

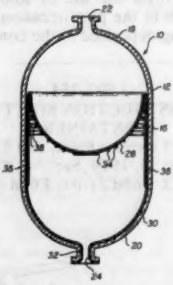
A nonresilient container for a pressurized primary fluid and an internal collapsible resilient holder for a secondary fluid, the fluids being placed in fluid mixing communication in a slidable valve stem by a resilient valve member which is of a compliance and construction such that a normal valve stem movement is available even though only a minor movement under certain tolerances may be required for opening minute pinhole sized ports and accomplishing the discharge of very low viscosity fluids. The lost action or over movement of a part of the valve member enables the storage of sufficient energy to insure return of the valve stem to full closed position by the valve member.



3,592,360
CYLINDRICAL FLUID STORAGE AND EXPULSION TANK

Benjamin J. Aleck, Jackson Heights, N.J., assignor to Arde, Inc., Paramus, N.J.

Filed June 28, 1967, Ser. No. 649,704
Int. Cl. B65d *35/28*
U.S. Cl. 222—95 12 Claims



Means for preventing the radial collapse of a cylindrical portion of an expulsion bladder is secured to the bladder in such a way that the bladder can not be separated from the reinforcement in a normal direction by the application of actuation pressure but can be peeled away from the reinforcement by forces resulting from the actuation pressure.

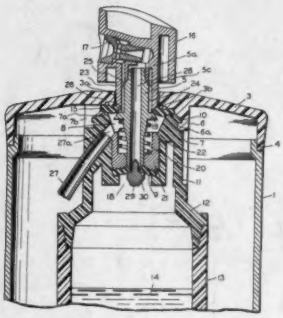
3,592,361
JOINT FOR JOINING PARTS OF AN AEROSOL-TYPE DISPENSER

Jean Marand, St. Benoit, France, assignor to Geigy Chemical Corporation, Greenburgh, N.Y.

Filed Apr. 23, 1969, Ser. No. 818,569
Int. Cl. B67d *5/52*
U.S. Cl. 222—136 7 Claims

A joint for joining parts of an aerosol-type dispensing device having a cap member and a valve assembly with a

valve member. The joint has a male joint means on one of said members and a female joint means on the other of said members. The male joint means has a radially extending portion and the female joint means has a radially extending portion. The radially extending portion of the male joint means is engaged over the radially extending portion of the female joint means between the radially extending portion of the



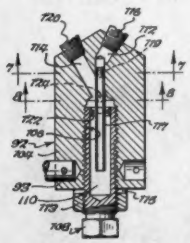
female joint means and the member on which the female joint means is positioned, and the radially extending portion of the female joint means is engaged over the radially extending portion of the male joint means between the radially extending portion of the male joint means and the member on which the male joint means is positioned. The cap member and the valve body member are thus tightly connected.

3,592,362

APPARATUS HAVING INVESTABLE METERING CHAMBER

Kenneth G. Kane, Cheektowaga, N.Y., assignor to Pin Point Products Inc., Buffalo, N.Y.

Filed Feb. 28, 1969, Ser. No. 803,359
Int. Cl. G01f *11/00*
U.S. Cl. 222—148 **8 Claims**



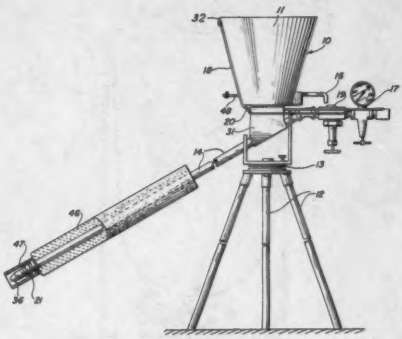
A wear-testing apparatus comprising a pneumatic system for feeding and discharging abrasive particles against a test specimen. The system includes a metering device having an adjustable gauge tube for measuring a charge of abrasive particles. An orifice is provided at the outlet end of the gauge tube for metering the rate of discharge flow of such charge at a controlled rate into the pneumatic feed system. The system includes a discharge nozzle utilizing a venturi tube for feeding the abrasive particles through the system and blasting the same against the test specimen. An elastic collar engageable with the surface of the test specimen, is mounted on the outlet end of the nozzle for confining the spent abrasive particles within the blast area and for recovering and collecting the spent particles.

3,592,363

DEVICE FOR ADDING FINE PARTICLE-SIZED SOLIDS TO A LIQUID STREAM

Ronald W. Stout, Gary, Ind., and John R. Albrecht, Grosse Point Park, assignors to Inland Steel Company, Chicago, Ill.

Filed Feb. 12, 1969, Ser. No. 798,634
Int. Cl. B67d *5/54*
U.S. Cl. 222—194 **4 Claims**



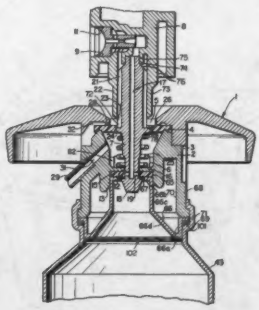
A device for adding fine particle-sized solids in a continuous casting operation whereby a uniform rate of addition of said solids is achieved by controlling the rate of flow of solids by means of a series of metering orifices in a feed bar attached to the bottom of a hopper and then propelling the particles through a series of tubes or conduits into the molten metal stream.

3,592,364

RETAINING RING INCORPORATING A CUTTING EDGE FOR USE IN AN AEROSOL DISPENSER VALVE ASSEMBLY

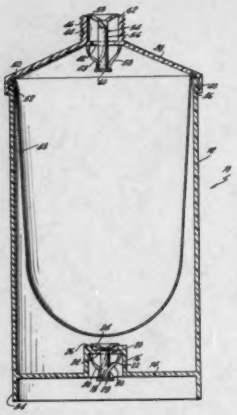
Marvin L. Thornton, Bayside, N.Y., assignor to Geigy Chemical Corporation, Greenburgh, N.Y.

Filed Aug. 27, 1969, Ser. No. 853,441
Int. Cl. B67d *5/54*
U.S. Cl. 222—193 **4 Claims**



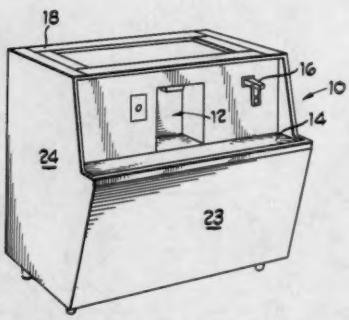
A retaining ring assembly. A retaining ring which is adapted to be positioned between a propellant cartridge of an aerosol dispenser, which cartridge has particles of propellant-adsorbent material therein, and a stem-obturating gasket of the dispenser has an annular cutting edge on the bottom thereof. The retaining ring is dipped in adhesive and pressed against a sheet of filter material so that the disc-shaped filter element thus cut out of the sheet is secured in the retaining ring. The retaining ring assembly is then assembled with the remainder of the dispenser.

3,592,365
PUMP-TYPE DISPENSING APPARATUS
Gilbert Schwartzman, 20 Wilmot Circle, Scarsdale, N.Y.
Filed Apr. 21, 1969, Ser. No. 817,946
Int. Cl. B65d *37/00*
U.S. Cl. 222—209 1 Claim



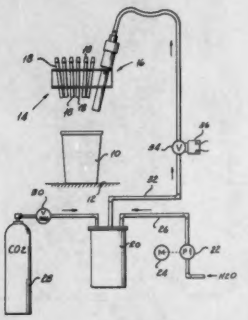
A dispensing apparatus comprising a squeezeable container having a bottom secured with a normally closed check valve adapted to open when the pressure in the container is less than atmospheric. An inflatable bag is disposed in the container and held in place by a cover detachably secured to the container. The cover has a dispensing opening therein defining a valve seat with a valve member disposed in the opening and having a valve head engaging the valve seat for closing the opening, said valve member including spring means integral with the cover.

3,592,366
ICE STORAGE AND DISPENSING APPARATUS
William F. Markley, and David D. Hart, both of York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.
Filed May 28, 1969, Ser. No. 828,497
Int. Cl. G01f *11/20*
U.S. Cl. 222—242 6 Claims



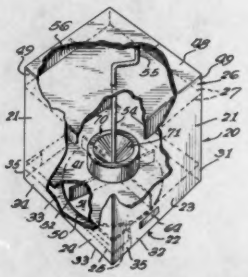
Apparatus for receiving and storing particulate ice, such as cubes, including a rotating dispenser which can be operated to release controlled quantities of ice on demand. A revolving disc carries lifters which provide small compartments for the receipt of ice discharged from a storage zone through apertures in the disc.

3,592,367
CARBONATOR NOZZLE ASSEMBLY FOR BEVERAGE-MERCHANDISING MACHINE
Bruce B. Landis, Long Valley, and Allan D. Barden, Lake Hiawatha, both of, N.J., assignors to Rowe International, Inc., Whippany, N.J.
Filed Feb. 27, 1969, Ser. No. 802,956
Int. Cl. B65d *83/14*
U.S. Cl. 222—394 11 Claims



A nozzle assembly for delivering carbonated water from a supply to a cup in a carbonated beverage dispensing machine in which carbonated water from a supply flowing to the nozzle inlet through a solonoid-operated valve during the dispensing operation moves a valve in the nozzle away from its seat against the action of a spring to provide restricted flow of the carbonated water around the valve to the nozzle outlet. The position of the valve seat in the nozzle is readily adjusted to regulate the resistance to flow of carbonated water through the nozzle. The nozzle body and the seat-forming inlet member do not require close tolerances and are formed of synthetic resin having relatively good dimensional stability. The parts are easily disassembled for cleaning.

3,592,368
COMBINATION CONTAINER AND SPREADER PACKAGE FOR PARTICULATE MATERIAL
Christian Albert Huette, Fairbury, Ill., assignor to Honeggers & Co., Inc., Fairbury, Ill.
Filed July 2, 1969, Ser. No. 838,536
Int. Cl. G01f *11/20*
U.S. Cl. 222—410 14 Claims



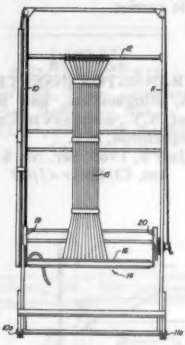
A unit package including a shipping, display and storage container for particulate material, and one or more enclosed housings, at one or both vertical ends of the package, containing the components of a mechanical spreader. Each housing includes a removable portion detachable to expose the spreader elements and provide access thereto. Detachment of the removable portion from the lower housing exposes an opening through which particuiate material may be expelled from the lower housing by the spreader element. In use, the package is carried by a strap slung around the neck of a person who manually operates the mechanical spreader.

3,592,369

DRAPERY PLEATING AND FOLDING APPARATUS

John H. Hales, Aurora, Utah

Filed May 8, 1970, Ser. No. 35,681
Int. Cl. A41h *43/00*; D06j *1/00*
U.S. Cl. 223—32 10 Claims



An apparatus for pleating and stretching draperies after cleaning and when they are being folded and finished. The apparatus includes a pair of upright standards with an elongate horizontal drapery hanger bar extending between the standards and arranged for vertical travel along the standards. A plurality of drapery connectors are movable horizontally along the hanger bar and are arranged to suspend a drapery therefrom such that it can be positioned to be grasped by a pleater assembly that is also arranged to extend between the vertical standards. The pleater assembly is thus beneath the hanger bar and it is also mounted for vertical travel with respect to the upright standards.

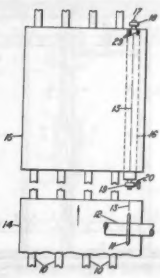
The pleater assembly includes a pair of interacting pleater members adapted to clamp the pleats in the lower portion of the drapery. For this purpose, one of the pleater members has inflatable fingers expandable into pressing engagement with respect to interacting fingers of the other pleater member, thereby clamping the positioned drapery pleats between the interacting fingers and holding them as the hanger bar is elevated to stretch the drapery.

3,592,370

CUTTING OF GLASS SHEETS

Peter Boardman, Newton-le-Willows, England, assignor to Pilkington Brothers Limited, Liverpool, England

Filed Nov. 6, 1969, Ser. No. 874,433
Claims priority, application Great Britain, Nov. 14, 1968, 54,140/68
Int. Cl. B26f *3/00*
U.S. Cl. 225—2 19 Claims



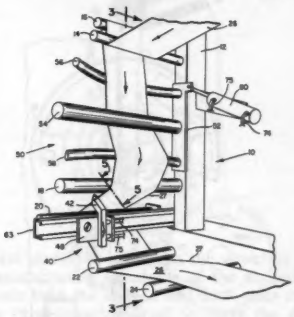
A glass sheet is divided along a required line of break delineated by a score line on the sheet by supporting the sheet on an elongated member disposed in the region of the required line of break and making line contact with the underface of the sheet. One end of the member is then raised and a bending moment is applied across the raised end of the score line so as to effect a break which runs along the supported line.

3,592,371

BAND WIDTH CONTROLLER

William Kirk Wyatt, Lansdale, and John R. Brownell, Telford, both of, Pa., assignors to Turbo Machine Company, Lansdale, Pa.

Filed June 23, 1969, Ser. No. 835,546
Int. Cl. B65h *25/26*
U.S. Cl. 226—18 6 Claims



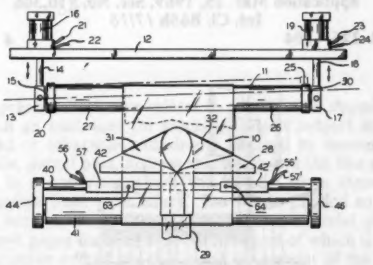
A control means for the adjustment of the band width of a moving band of continuous material which passes over a plurality of tensioning bars and is subject to deviations in its width due to its inherent properties in such an environment, comprises at least one bar presenting a curved surface to one face of the continuously moving band, said surface, upon engaging said face, causing said band to spread or become narrower in accordance with the disposition of said curved surface. The bar is actuated by an amplifier-controller and servomotor which is constantly error sensitive in that error-measuring means are provided downstream being in engagement with said band to measure the error and effect the input signal to the amplifier-controller. In alternate embodiments a plurality of curved surfaces are presented to one or more faces of said band, said surfaces being movable by means which are controlled either independently or commonly.

3,592,372

APPARATUS FOR WEB EDGE ALIGNMENT

Robert C. James; Walter H. Vogel, and Richard D. Sorenson, all of Sheboygan, Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Sept. 5, 1968, Ser. No. 757,600
Int. Cl. B65h *25/08*
U.S. Cl. 226—22 6 Claims



A web-edge-aligning system for aligning a web such as a plastic film which is to be formed into containers, is disclosed. A shiftable web guide roller has adjustable cylinders mounted at its opposite ends for independently adjusting the

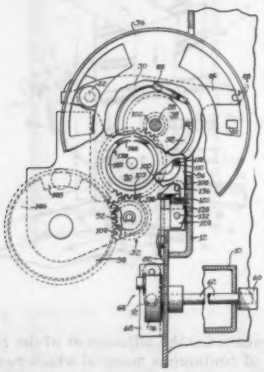
ends of the roller so as to move the web as it passes over the roller. Fluid sensors are mounted on each side of the web after it passes over the roller and detect when the web edges are properly aligned. If the web is misaligned, the sensors control valves to operate the cylinders so that the film is again centered and aligned.

3,592,373

VARIABLE-SPEED FILM MOVEMENT MECHANISM

Raymond W. H. Kim, Morton Grove, and Arthur E. Nupnau, Chicago, both of, Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Oct. 6, 1969, Ser. No. 863,821
Int. Cl. G03b *1/28*
U.S. Cl. 226—66 **12 Claims**



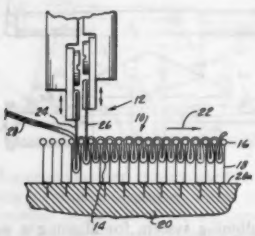
A variable-speed film movement mechanism for a motion picture projector is provided wherein a shuttle, adapted to move the film across the projection axis, is moved into and out of engagement with the film perforations at speeds that are related to, but may be different from, the rate of up-and-down movement of that shuttle. The mechanism includes a shaft having mounted thereon an up-and-down cam adapted to move the shuttle cyclically up and down at a predetermined rate, and a normal cam operatively connected to move the shuttle in and out of film engagement in synchronism with the movement of the shuttle. A control mechanism is adjustable to enable selection of other cams and mechanism to cancel selected actuations of the normal cam and to provide rates of film movement at slow motion and very slow or stop motion in addition to normal motion.

3,592,374

APPARATUS FOR PRODUCING A PILE FABRIC

Ralph M. Adler, New York, N.Y., assignor to Adler Process Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 793,842, Jan. 24, 1969, which is a continuation-in-part of application Ser. No. 520,402, Jan. 13, 1966, now Patent No. 3,424,632. This application Mar. 25, 1969, Ser. No. 810,306
Int. Cl. B65h *17/18*
U.S. Cl. 226—104 **4 Claims**



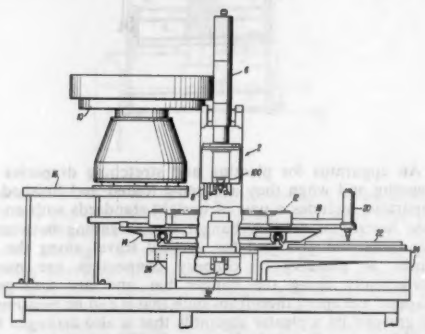
An apparatus for the manufacture of nonwoven pile fabrics suitable for carpeting or the like includes an array of loop-forming members arranged in paired relationship, the array being adapted to travel past a loop-forming station wherein loops of yarn are formed. Each of the loop-forming members comprises a relatively elongated bead portion upon which yarns are disposed to form loops when the yarns are inserted between a pair of said loop-forming members, and a relatively elongated flexible slat portion at one edge integral with the bead portion and adapted to be fixed at the other end to a dimensionally stable carrier.

3,592,375

TRANSISTOR INSERTER

Albert W. Zemek, Binghamton, and Robert H. Holmes, Marathon, both of, N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed July 8, 1969, Ser. No. 839,846
Int. Cl. H01r *43/00*
U.S. Cl. 227—87 **17 Claims**



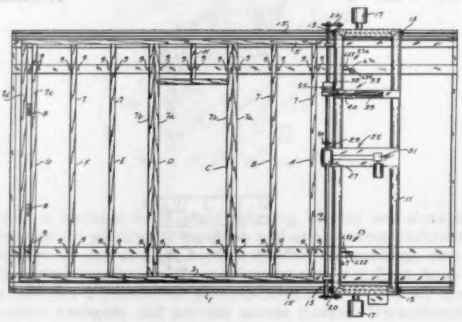
A transistor inserter mechanism for inserting transistors with leads which has lead-straightening blades, guide arms to align the leads with predrilled holes in a circuit board and an ejector plunger. A slide block and spindle are mounted in a retainer for joint and relative movement during which the straightening blades first engage and disengage the leads and the guides are employed. The guides are disengaged after the leads enter the holes but prior to the operation of the ejector plunger.

3,592,376

APPARATUS FOR PREFABRICATING WOODEN PANEL FRAMES

Walter George Moehlenpah, Ladue, Mo., assignor to Hydro-Air Engineering, Inc., St. Louis, Mo.

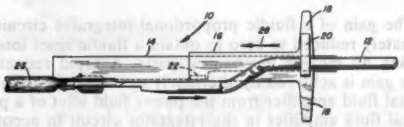
Filed Jan. 8, 1970, Ser. No. 1,395
Int. Cl. B27f *7/02*
U.S. Cl. 227—101 **12 Claims**



Apparatus for prefabricating wood frames for walls, ceilings and floors of buildings, mobile homes and sectional or stack housing, comprising a jig on which transverse and longitudinal members may be laid out in position for being

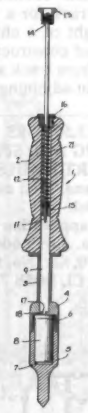
nailed together, and a carriage carrying nailers movable along the jig in the direction of length of the longitudinal members for driving nails through the longitudinal members into the ends of the transverse members. The apparatus automatically senses the provision of multiple transverse member groups in a layout and provides automatically for movement of the carriage and operation of the nailers to nail not only the first but also the subsequent transverse members of such groups.

3,592,377
HEMOSTAT UNIT
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Baltimore, Md.
Filed Oct. 24, 1969, Ser. No. 869,242
Int. Cl. B25c *5/02*
U.S. Cl. 227—120 9 Claims



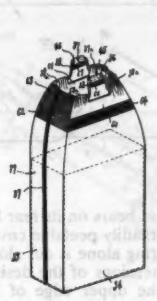
A hemostat unit comprising, in combination, a hemostat and a staple carrying and ejecting system for clamping a fluid-carrying artery and stapling same so as to seal off the flow of fluid. A plurality of staples is positioned on respective threads of a screw, which screw is turned one revolution each time the unit is activated. A vertically oriented driver, slidably mounted in the forwardmost part of the stapling unit, serves to eject the staples one at a time and to force same against an anvil to shape the staples. The driver is moved in response to the movement of a rotatably mounted driver-activating member, which latter member is caused to pivot in response to the command of the operator.

3,592,378
SOLDERING IRON
Frank A. Petraglia, New York, N.Y., assignor to Metro-Tel Corp., Westbury, N.Y.
Filed Oct. 21, 1968, Ser. No. 769,071
Int. Cl. B23k *3/02*
U.S. Cl. 228—51 8 Claims



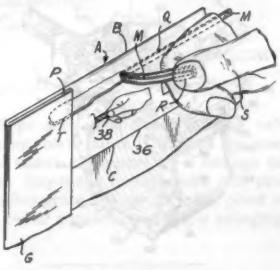
A portable soldering iron having a hollow chamber next to the soldering tip which holds a cartridge that contains heat-producing chemicals. A spring-pressed firing pin is placed in a bore in the handle of the iron and is adapted to pass through a small aperture to strike the cartridge causing the chemicals to ignite to produce heat which is conducted to the soldering tip.

3,592,379
SHOPPING BAG WITH STRING
Toshio Nakamura, 27, 1-chome, Tanabe-nishinocho Higashisumiyoshiku, Osaka, Japan
Filed Sept. 4, 1969, Ser. No. 847,007
Claims priority, application Japan, Aug. 15, 1968, Mar. 20, 1969, Apr. 8, 1969, 43/58165; 44/21452; 44/27034
Int. Cl. B65d *33/06*
U.S. Cl. 229—54 5 Claims



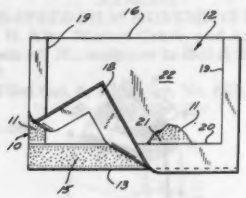
The present invention relates to the structure, the process and the manufacturing apparatus of the shopping bag with string, wherein both the surface and back sides of the bag are respectively turned back inward to form the double parts, into which are inserted said strings made of a synthetic resin, while in the upper and central part of the bag are perforated the separable gripping pieces, which will be pulled out together with the strings held by them, so that said bag can be closed in its mouth and carried by hand in safety.

3,592,380
CUSHIONED SHIPPING BAG
George Gerard, Point Pleasant, N.J., assignor to Jiffy Manufacturing Co., Hillside, N.J.
Filed May 28, 1969, Ser. No. 828,651
Int. Cl. B65d *5/54, 5/70, 23/00*
U.S. Cl. 229—66 5 Claims



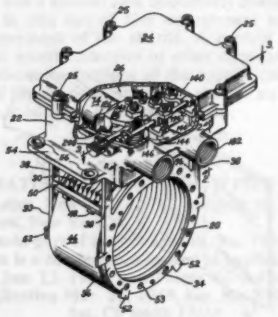
The present disclosure relates to a cushioned shipping bag in which an enclosure for shipping objects subject to being damaged or otherwise undesirably affected by movement in the mails, parcel post, express shipments and the like may be placed in a container which will protect them through its construction from such injury. The bag is padded so that a filler is between two layers of flexible sheet material, particularly kraft paper forming a sleeve, one end of which is sealed and the other end of which is open for receipt of the article to be shipped. The bag along one side adjacent the edge thereof is provided with a tearsheet to permit ready opening thereof. This tear strip is desirably positioned adjacent the edge of the bag and adjacent the sleeve point or the junction point of the side of the tube.

3,592,381
POCKET-FORMING DEVICE FOR LIBRARY CARDS
Arthur Brody, South Orange, N.J., assignor to Bro-Dart Industries
Filed Oct. 3, 1969, Ser. No. 863,621
Int. Cl. B65d *27/14*
U.S. Cl. 229—74 2 Claims



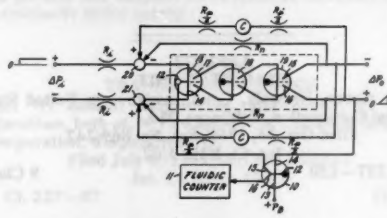
A rectangular sheet bears on its rear face a pressure-sensitive adhesive and a readily peelable covering equal in size to the sheet. The covering alone is cut along lines enclosing an area having the dimensions of the desired pocket and lying directly alongside the upper edge of the sheet. This area remains secured to the sheet when the marginal portion of the covering is peeled from the sheet to expose a U-shaped adhesive region. When the sheet is secured to a flat book surface by means of the adhesive region, the area of the covering defined by the cuts remains attached to the sheet to serve as the front wall of the pocket for accommodating a library card.

3,592,382
CONTROL APPARATUS HAVING REDUNDANT CONDITION-SENSING MEANS AND FAILURE INDICATOR
Boyd P. Byrer, South Bend, Ind., assignor to The Bendix Corporation
Filed Nov. 19, 1969, Ser. No. 878,123
Int. Cl. G05d *23/00*
U.S. Cl. 236—86 9 Claims



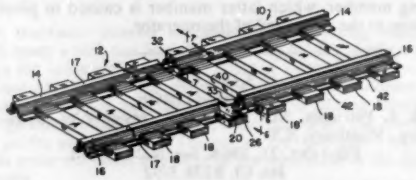
A casing contains two fluid-pressure-responsive members each of which is responsive to an associated input fluid pressure which varies as a function of the same sensed variable condition. A servo valve actuated in response to the higher of the two outputs of the fluid-pressure-responsive members controls a servovalve which, in turn, establishes a control output which controlled servo pressure is applied to a separate feedback-fluid-pressure-responsive member associated with each of the two fluid-pressure-responsive members and connected to oppose the output thereof. A loss of input fluid pressure to either fluid-pressure-responsive member results in actuation of a visual failure indicator by the associated feedback-fluid-pressure-responsive member while the input fluid pressure to the remaining fluid-pressure-responsive member maintains the desired servo fluid pressure.

3,592,383
FLUIDIC RESET INTEGRATOR CIRCUIT
Carl G. Ringwall, Scotia, N.Y., assignor to General Electric Company
Filed Apr. 29, 1970, Ser. No. 32,990
Int. Cl. G06d *5/00*
U.S. Cl. 235—200 PF 12 Claims



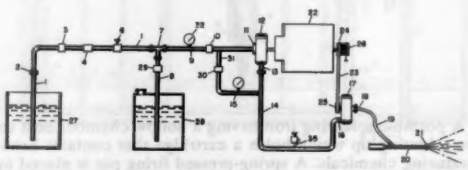
The gain of a fluidic proportional integrator circuit is alternately reduced to zero to obtain a fluidic reset integrator having no moving mechanical parts. A rapid reduction to zero gain is achieved by alternately switching the output of a digital fluid amplifier from the power fluid inlet of a proportional fluid amplifier in the integrator circuit in accordance with the pressure magnitude at the output of the integrator circuit.

3,592,384
PORTABLE TOY TRAIN TRACK
Patrick M. Tomaro, Maplewood, N.J., assignor to Remco Industries, Inc., Harrison, N.J.
Filed Feb. 24, 1970, Ser. No. 13,503
Int. Cl. A63h *19/30*
U.S. Cl. 238—10 E 10 Claims



A portable toy train track is described wherein sturdy portable lightweight track sections interlock with one another to form a train track for a toy train of a size sufficient to support the weight of a child. The train track sections are of unitary molded construction with molded flanges extending longitudinally from track sections to interlock with flange receiving recesses in adjoining sections.

3,592,385
PROCESS FOR MAKING AND SPRAYING PESTICIDAL INVERT EMULSION
Ward Alan Smith, Louisiana, Mo., assignor to Hercules Incorporated, Wilmington, Del.
Continuation-in-part of application Ser. No. 674,416, June 20, 1967, now Patent No. 3,499,606. This application Feb. 17, 1970, Ser. No. 11,996
Int. Cl. B05b *7/04*
U.S. Cl. 239—10 6 Claims



Disclosed is a pesticidal invert emulsion making and spraying process in which the water phase is finely dispersed in the oil phase by mechanical rotary agitation in a mixing chamber

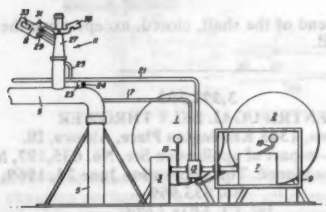
with an induced flow opposed to the flow of said phases into said chamber and under hydrostatic pressure sufficient to push invert emulsion out the outlet of said chamber through a conduit into a spray nozzle and out of said nozzle as a spray.

3,592,386

METHOD FOR SIMULTANEOUSLY IRRIGATING AND FERTILIZING AN AGRICULTURE FIELD

Jay Tschudy, Jr., Shawnee Mission, Kans., assignor to Precision Agricultural Machinery Company, Phoenix, Ariz.

Filed Jan. 23, 1969, Ser. No. 793,455
Int. Cl. B05b *1/26*
U.S. Cl. 239—10 1 Claim



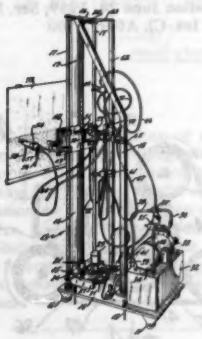
This invention relates to an agricultural process, and apparatus for carrying out the process, in which chemicals that are to be applied to a growing crop are admixed with irrigation water that is sprayed onto the crop. The irrigation water and the liquid chemicals (usually in the form of aqueous solutions, dispersions or emulsions) are delivered by separate lines to separate nozzles which are positioned in such a manner that the agricultural product streams issuing therefrom converge and mix exterior to the nozzles whereinafter the mixed stream falls upon the desired location.

3,592,387

HYDRAULIC-POWERED SCREW-DRIVEN PAINT SPRAYER

Ulysse J. Pilotte, and John P. Pilotte, both of 1519 Whittier, Ypsilanti, Mich.

Filed Dec. 24, 1969, Ser. No. 887,867
Int. Cl. B05b *3/18*
U.S. Cl. 239—186 6 Claims



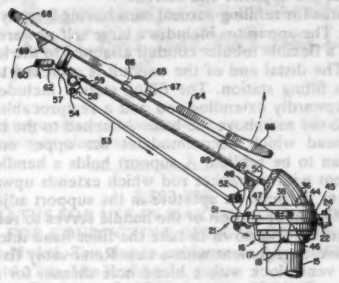
Apparatus including a carriage adapted to be moved rectilinearly along a desired plane by a rotatable screw-threaded shaft. The shaft is reversibly driven by fluid motor means supplied with fluid under pressure and adapted to be automatically reversed when a portion of the carriage engages limit switch means.

3,592,388

PART-CIRCLE SPRINKLER HEAD WITH BALL BEARING SWIVEL, ADJUSTABLE CAMS FOR DEFLECTOR SPOON AND OSCILLATING SPRAY DEFLECTOR

Richard F. Friedlander, P.O. Box 847, Moultrie, Ga.

Filed July 1, 1969, Ser. No. 838,080
Int. Cl. B05b *3/08*
U.S. Cl. 239—233 5 Claims



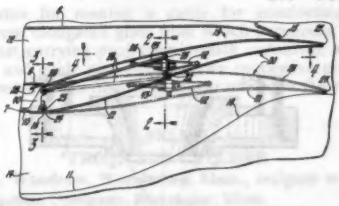
A rugged and durable, lightweight sprinkler head features a ball bearing swivel of simplified and and economical construction without the usual expensive machining. An improved camming system enables part-circle operation through any chosen angle with a very rapid return movement. The sprinkler head is easily convertible to full-circle operation. Bearing lubrication is provided.

3,592,389

FLAP LINKAGE

Douglas Johnson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1969, Ser. No. 879,111
Int. Cl. B64c *15/06*
U.S. Cl. 239—265.27 3 Claims



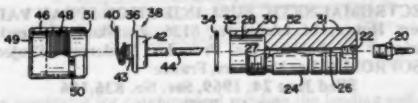
A ring of flaps acts as a freely floating valve member between two concentric ducts. The flaps are interconnected for joint equal radial movement by a linkage comprising a circular endless lazy-tongs linkage with one pivot on each flap and a parallelogram linkage for each pivot which maintains the pivot radial notwithstanding the swinging movement of the flaps.

3,592,390

SPRAYING APPARATUS AND MEANS FOR REFILLING SPRAY CANS

Albert R. Morse, Beachwood, Ohio, assignor to IMS Company, Cleveland, Ohio

Filed Apr. 1, 1969, Ser. No. 812,270
Int. Cl. B05b *1/12*
U.S. Cl. 239—391 7 Claims



A combination of a self-powered supply container and a handgun for spraying parting material onto the surfaces of

the molds. Fluid parting material under pressure exits from the lowermost portion of the container when in an operating position into a flexible conduit which conducts the fluid to a manually operable handgun having a conventional spray head and valve assembly clamped to a cylindrical body with a surge or vapor chamber therein. The actuation of the valve assembly also may be by a pneumatic or solenoid, automatic or semiautomatic control system.

An aerosol can having a spray head on each end and with each head including a flexible tubular inlet extending into the can to near the opposite end thereof.

Apparatus for refilling aerosol cans having a spray head on each end. The apparatus includes a large self-powered supply tank with a flexible tubular conduit attached to the lower end thereof. The distal end of the conduit is attached to a filler head at a filling station. The filling station includes a base with an upwardly extending rod and a reciprocable bracket secured to the rod above the base. Attached to the bracket is a filler head which accommodates the upper end of an aerosol can to be refilled. A support holds a handle in gear engagement with a bracket rod which extends upward from the bracket, through an aperture in the support adjacent the handle. Manual operation of the handle serves to reciprocate the bracket up and down to take the filler head into and out of operative engagement with a can. Removably fixed to the base is a vent block with a bleed hole therein for receiving the lower end of the spray can.

A container of parting material and propellant wherein the propellant is selected from the group comprising dichlorodifluoromethane, trichloromonofluoromethane, nitrogen, isobutane, dry air, carbon dioxide and mixtures thereof.

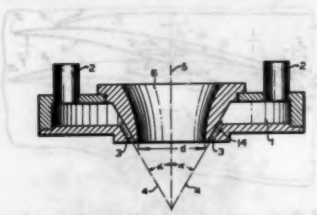
3,592,391

NOZZLE FOR ATOMIZING MOLTEN MATERIAL

Ludwig Bender, Bruhl near Cologne; Wilfried Gerhardt, Knapsack near Cologne, and Klaus Frank, Hermulheim near Cologne, all of, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Cologne, Germany

Division of Ser. No. 543,156, Apr. 18, 1966, abandoned. Filed Jan. 27, 1969, Ser. No. 794,274
No. 794,274
Int. Cl. B05b *7/10*

U.S. Cl. 239—406 **6 Claims**



A nozzle for atomizing molten material includes annularly arranged outlet openings for an atomizing agent with a central aperture for the molten material. The axis of each outlet opening is inclined in the vertical plane with respect to the vertical axis of the central aperture at an angle α. Each outlet opening axis is also skewed with respect to the central aperture axis so that in the horizontal plane it deviates therefrom by the angle β. The angle α is between 20° and 50° and the angle β is between 10° and 40° with greater angles β being associated with greater angles β and with smaller angles α being associated with smaller angles β.

3,592,392

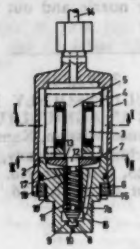
ELECTROMAGNETIC FUEL INJECTION SPRAY VALVE

Robert Huber, 14 Islerenweg 8126, Zumikon, Switzerland, assignor to Societe des Procedes Modernes d'Injection "SOPROMI", Les Mureaux, France

Filed June 24, 1969, Ser. No. 836,106
Int. Cl. B05b *1/30*

U.S. Cl. 239—585 **9 Claims**

Valve has a disc-shaped armature with a hollow shaft containing a compressed coil spring that holds the valve proper,



carried at the end of the shaft, closed, except when the magnet is energized.

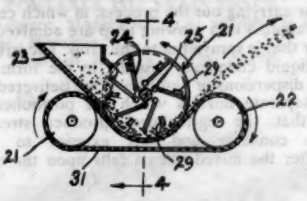
3,592,393

CENTRIFUGAL BELT THROWER

Alfred D. Sinden, 1348 Kensington Place, Aurora, Ill.

Continuation-in-part of application Ser. No. 635,197, May, 1967, now abandoned. This application June 24, 1969, Ser. No. 835,969
Int. Cl. A01c *17/00*

U.S. Cl. 239—669 **4 Claims**



This centrifugal belt thrower is provided with pivoted vanes and supported in the discharge wheel, and in operation is extended substantially radially toward the belt but can pivot and retract from the belt as they encounter material carried on the belt.

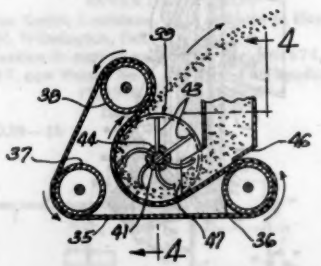
3,592,394

CENTRIFUGAL BELT THROWER

Alfred D. Sinden, 1348 Kensington Place, Aurora, Ill.

Continuation-in-part of application Ser. No. 635,197, May 1, 1967. This application June 24, 1969, Ser. No. 835,970
Int. Cl. A01c *17/00*

U.S. Cl. 239—669 **8 Claims**



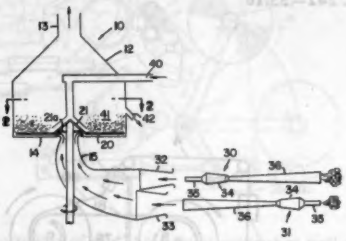
This centrifugal belt thrower is provided with very flexible flaps supported in the discharge wheel and extended toward the belt by centrifugal force into contact with the material to be thrown. They flex when they encounter material on the belt, and the material is fed directly onto the belt entering through the periphery of the wheel.

3,592,395

STIRRED FLUID-BED DRYERS

Raymond M. Lockwood, Los Altos, and David A. Graber, Menlo Park, both of, Calif., assignors to International Dehydrating Corporation, Fullerton, Calif.

Filed Sept. 16, 1968, Ser. No. 759,959
Int. Cl. B02c 21/00
U.S. Cl. 241—18 20 Claims



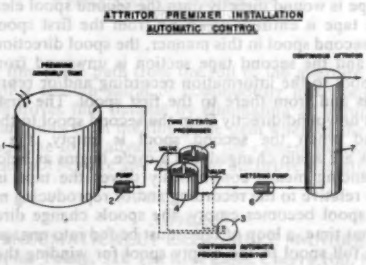
A direct-heat-stirred fluid-bed dryer for fluidizing continuously changing portions of a slurry or other moist product to be dried while stirring the product and applying sonic energy to the product for efficient dehydration.

3,592,396

GRINDING AND APPARATUS THEREFOR

Andrew Szegvari, 201 Castle Blvd., Akron, Ohio

Division of Ser. No. 591,459, Nov. 2, 1966, Patent No. 3,493,182, which is a continuation-in-part of application Ser. No. 407,716, Oct. 30, 1964, now abandoned.
Filed July 14, 1969, Ser. No. 869,413
Int. Cl. B02c 17/16
U.S. Cl. 241—98 4 Claims



Apparatus for statistical grinding of material by grinding media maintained in motion by agitation means. The apparatus (1) may be for use on a batch basis or a continuous basis, or (2) may use grinding media of different sizes in a multistep operation, or (3) both. When using grinding media of different sizes, larger grinding media are first used, and then smaller grinding media, in separate vessels. In apparatus for a preferred operation larger grinding media are used in a batch operation, followed by smaller grinding media in a continuous operation.

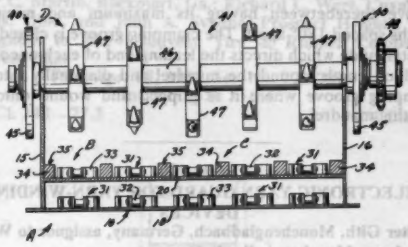
3,592,397

BREAKER CONVEYORS

William H. Mathys, Oak Hill, W. Va., assignor to The Marmon Group, Inc., Chicago, Ill.

Filed July 18, 1969, Ser. No. 843,057
Int. Cl. B02c 13/06;, 13/286
U.S. Cl. 241—187 7 Claims

A breaker-type conveyor including a plurality of conveyor elements and wherein breaker bars are provided to each side



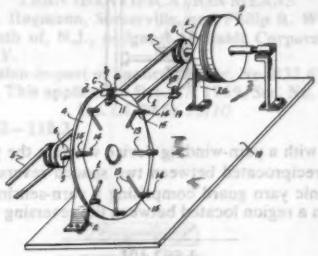
of the conveyor elements in position to relieve breaking loads on the conveyor elements.

3,592,398

APPARATUS FOR USE IN MAKING A FIBER BUNDLE FOR CONDUCTING OPTICAL IMAGES

Kunihiko Mukai, Tsu, Japan, assignor to Nippon Glass Fiber Co., Ltd., Tsu, Mie Prefecture, Japan

Filed Nov. 3, 1969, Ser. No. 873,147
Int. Cl. B65h 54/00
U.S. Cl. 242—18 6 Claims



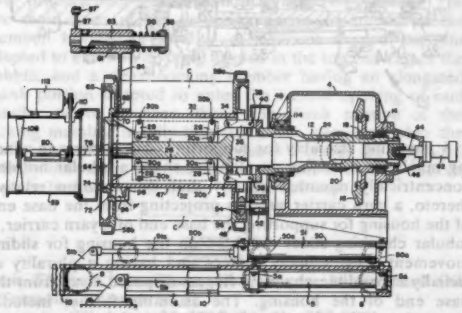
Apparatus for making a cable for conducting optical images from elongated glass fiber which comprises a rotatable support carrying projections which constitute a reel for the fiber and guide pins between two successive projections which constrain said fiber into a layer one fiber thick.

3,592,399

FRONT END CATCHER

Harold E. Woodrow, Worchester, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Aug. 4, 1969, Ser. No. 847,078
Int. Cl. B65h 54/00, 75/28
U.S. Cl. 242—25 10 Claims



An apparatus for catching and winding the leading end of a product length on a rotating mandrel. The apparatus includes a rotatably clamping surface surrounding one end of the

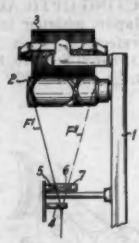
mandrel. The rotational axis of the clamping surface is urged away from that of the mandrel, thus forming a clamping groove therebetween having its maximum and minimum widths spaced 180° apart. The clamping groove is closed by a pivotal guide which directs the leading end of each oncoming product length around the mandrel and diagonally into the clamping groove where it is gripped and wound onto the rotating mandrel.

3,592,400

ELECTRONIC YARN GUARD FOR YARN-WINDING DEVICES

Walter Gith, Monchengladbach, Germany, assignor to Walter Reiners, Monchengladbach, Germany

Filed Nov. 22, 1967, Ser. No. 685,065
Claims priority, application Germany, Nov. 23, 1966, R 44 637
Int. Cl. B65h *63/00*
U.S. Cl. 242—36 **5 Claims**



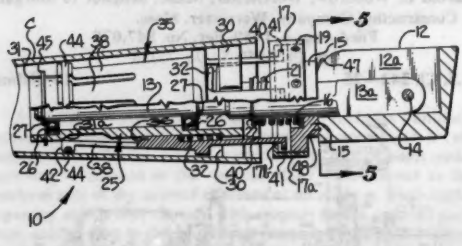
For use with a yarn-winding device wherein the yarn being wound is reciprocated between two spaced reversing nodes, an electronic yarn guard comprising a yarn-sensing member disposed in a region located between the reversing nodes.

3,592,401

CHUCKING ASSEMBLY FOR WINDING MACHINES

Ashley P. Smith; William L. Wilson, and Ralph A. Caneer, all of Asheville, N.C., assignors to Northrop Carolina, Inc., Asheville, N.C.

Filed Oct. 15, 1969, Ser. No. 866,500
Int. Cl. B65h *75/30, 79/00*
U.S. Cl. 242—46.3 **18 Claims**



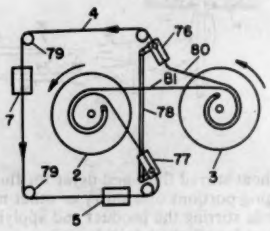
A chucking assembly for supporting yarn carriers in winding machines including an elongate shaft, a tubular housing concentrically mounted on the shaft for rotation relative thereto, a yarn carrier support projecting from the base end of the housing for supporting the base end of a yarn carrier, a tubular chucking slider mounted on the housing for sliding movement longitudinally thereof and having a plurality of radially expandible chucking fingers disposed away from the base end of the housing. The assembly further includes means for sliding the chucking slider relative to the housing and means for radially expanding the chucking fingers into a chucking condition when the chucking slider is slid, so that the fingers will engage and exert a radial pressure against the yarn carrier positioned on the chucking assembly.

3,592,402

TAPE WINDING APPARATUS FOR RECORDING AND/OR REPRODUCING OF INFORMATION ON AN ENDLESS TAPE

Johan Eric Hayden Westberg, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Apr. 22, 1968, Ser. No. 723,053
Claims priority, application Sweden, Apr. 21, 1967, Sept. 26, 1967, Apr. 3, 1968, 5,664/67;13,167/67;4,418/68
Int. Cl. B65h *65/02*
U.S. Cl. 242—55.16 **10 Claims**



The invention relates to a tape-winding device for moving a tape in a single direction relative to means for recording and/or reproducing information on said tape. The tape is endless and increased tape-running time is provided by a pair of spool means. The tape is wound in a doubled-back or bifilar manner on a first spool. A first section of tape is fed therefrom to the information recording and/or reproducing means and from there to the second spool. The second section of tape is wound directly onto the second spool element. After the tape is entirely unwound from the first spool and onto the second spool in this manner, the spool directions are reversed and the second tape section is unwound from the second spool to the information recording and/or reproducing means and from there to the first spool. The first tape section is unwound directly from the second spool to the first spool and when the second spool is empty, the spool directions are again changed and a cycle begins as before. A tape-advancing means continuously drives the tape in one direction relative to the recording and/or reproducing means. When a spool becomes empty, the spools change direction and, at that time, a loop of tape must be fed into engagement from the full spool to the empty spool for winding thereon. According to the present invention, the tape loop is guided to the empty spool by an airstream. The airstream may also be used to change the direction of rotation of the spools.

3,592,403

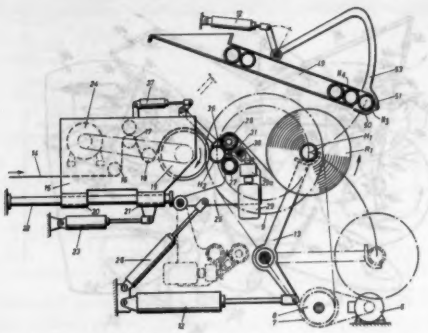
APPARATUS FOR REPLACING CORES AND SEVERING WEBS IN HIGH-SPEED MULTIPLE WINDING MACHINES

Walter Schmitt, Bad Pyrmont, and Wilhelm Schuttler, Klein Berkel, Germany, assignors to Maschinenfabrik Stahlkontor Weser Lenze KG, Gross Berkel/bei Hameln, Germany

Filed Apr. 8, 1969, Ser. No. 814,426
Claims priority, application Germany, Apr. 8, 1968, P 17 74 101.4
Int. Cl. B65h *19/20*
U.S. Cl. 242—56 **13 Claims**

In a multiple-winding machine with continuously advanced web material, an empty core is positioned upstream of the almost-completed core and held against the running web by axially grasping winding shafts and by rolls forming a three-point support. A self-aligning knife transversally severs the web on said empty core onto which the web is subsequently

wound after an airblast maintains the new leading edge of the web thereon. The full core is then removed and two rolls

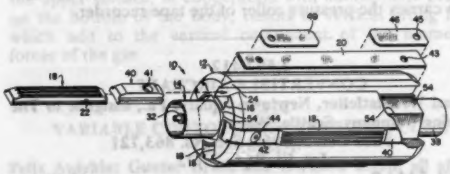


forming two points of said three-point support as well as said knife are swung away.

3,592,404
METHOD AND APPARATUS FOR IMPROVING THE FLATNESS OF ROLL FILM IN A CAMERA EXPOSURE APERTURE
Hubert Nerwin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 24, 1968, Ser. No. 700,055
Int. Cl. G11b *23/10*
U.S. Cl. 242—71.2 **8 Claims**

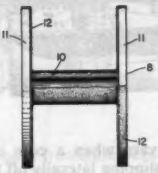
The film guide path from the roll to the aperture is in the form of a smooth spiral of continuously increasing radius. This improves film flatness by eliminating all abrupt curvature transitions from the film guide path whereby the next exposure frame to be advanced into the camera exposure aperture does not acquire any localized distortive curvature.

3,592,405
PNEUMATICALLY EXPANSIBLE MANDREL
Michael M. Young, 510 Tea Rose Lane, Cherry Hill, N.J.
Filed Oct. 9, 1969, Ser. No. 865,003
Int. Cl. B65h *75/24*
U.S. Cl. 242—72 **8 Claims**



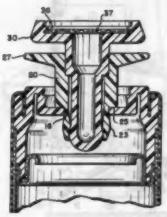
A pneumatically expansible mandrel is formed in an extruded aluminum body section that is mounted on and surrounds an extruded tubular steel core section. Multifaceted outer and inner mating surfaces on the two sections ensure proper torque transmission. The overall unit has strength comparable to a solid steel construction but at lower cost and without appreciably greater weight than a solid aluminum construction.

3,592,406
STEEL REEL HAVING A POLYURETHANE COVERING
Roger C. Martin, Rockmart, Ga.; Richard L. Wert, Cuyahoga Falls, Ohio, and John A. Svaline, Prospect Heights, Ill., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Apr. 18, 1968, Ser. No. 722,289
Int. Cl. B65h *75/14*
U.S. Cl. 242—77.3 **4 Claims**



An apparatus for storing wire cable wherein filaments or continuous wire are braided into a cable and the cable is stored on a steel reel having a polyurethane elastomeric covering.

3,592,407
YARN IDENTIFICATION MEANS
William G. Hagmann, Somerville, and Philip R. Worn, Princeton, both of, N.J., assignors to Baldt Corporation, New York, N.Y.
Continuation-in-part of application Ser. No. 832,672, June 12, 1969. This application Dec. 17, 1969, Ser. No. 885,892
Int. Cl. B65h *75/10*
U.S. Cl. 242—118.3 **13 Claims**

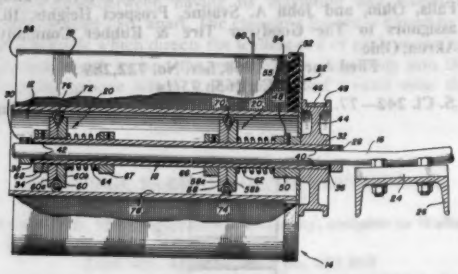


Means for visually identifying the source, type and character of yarn wound on a textile bobbin is disclosed. The means comprises a two-piece device removably mounted on the top end cap of the bobbin, each piece having a distinctive, predetermined visual characteristic (e.g., color). The two main parts of the device comprise an annular sleeve member having a plurality of resilient tongue portions adapted to enter an opening formed in the top end cap of the bobbin, and a sleeve-locking member having an elongated shank portion adapted to enter the central opening of said annular sleeve member. When the shank portion of the locking member is fully inserted in the sleeve member the resilient tongue portions of the sleeve member are displaced radially outwardly and the sleeve member is thereby locked in place in the opening of the top and end cap.

3,592,408
SPINDLE
Louis Eickhoff, Hazelhurst, Ga., assignor to Standard Oil Company, Chicago, Ill.
Filed Apr. 30, 1969, Ser. No. 820,414
Int. Cl. B65h *49/02;* **D03j** *5/08*
U.S. Cl. 242—130 **4 Claims**

Disclosed is a spindle comprising a shaft, a sleeve rotatably mounted on the shaft by means of spaced bearings, means

coupled to the sleeve which is adapted to retain a core having yarn wound about it, and a disc near the end of the sleeve

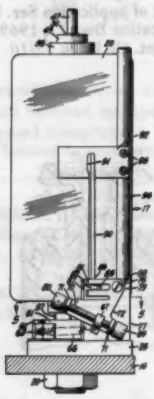


which engages the yarn when a core is being retained and prevents yarn from slipping laterally off the core.

3,592,409
YARN-TENSIONING MEANS FOR SPIRAL WINDING MACHINES

Robert H. Kaufmann, Temple, and John L. Wily, Reading, both of, Pa., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed July 14, 1969, Ser. No. 841,411
Int. Cl. B65h *59/38*
U.S. Cl. 242—156.2 **6 Claims**



Mechanism for controlling the rotational letoff speed of a yarn supply bobbin to maintain substantially constant tension of the yarn used in fabricating machines such as spiral winders and the like. The tension-controlling means includes reader means for reading the diameter of the yarn supply which acts through resilient means between the reader means and brake means to control the rotation speed of the yarn supply in accordance with the diameter of the yarn supply.

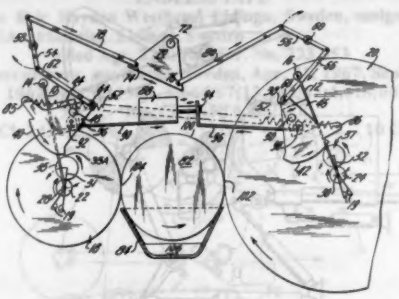
3,592,410
TAPE TRANSPORT APPARATUS

Richard B. Kosten, Bayside, and Ralph Johnson, Huntington, both of, N.Y., assignors to Sylvania Electric Products, Inc.

Filed Nov. 28, 1969, Ser. No. 880,800
Int. Cl. G03b *1/04*; G11b *15/32*; B11b *15/32*
U.S. Cl. 242—192 **6 Claims**

A tape transport utilizes a reversible rotatable capstan interposed between two spaced tape-wound spools and making resilient peripheral contact with a selected point on each spool. The direction of rotation of the capstan determines which spool acts as a supply and which spool acts as a takeup spool.

Cams, linkages, springs and drive rollers coupled to axial shafts extending through each spool establish a first pressure urging the takeup spool toward the capstan and applied at the point of arrival which is larger than and oppositely

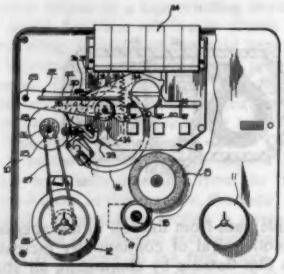


directed to a second pressure urging the supply spool toward the capstan and applied at the point of departure.

3,592,411
TAPE RECORDER

Philip H. Evans, Stourbridge, Worcester, England, assignor to B S R Limited, Wariey, Worcester, England

Filed July 24, 1969, Ser. No. 844,539
Claims priority, application Great Britain, July 25, 1968, 35,519/68
Int. Cl. B11b *15/32*; G03b *1/04*
U.S. Cl. 242—206 **10 Claims**



A takeup drive for a takeup spool of a tape recorder comprising a pulley, an endless belt engaged with the pulley to drive the takeup spool from the pulley, a friction wheel, a slipping clutch to transmit drive from the friction wheel to the pulley, and means for driving the friction wheel from the capstan spindle. The means for driving the friction wheel from the capstan spindle can comprise a second friction wheel interposed between the first friction wheel and the capstan spindle, and can be mounted so as to be moved into engagement therewith as a result of movement of an arm which carries the pressure roller of the tape recorder.

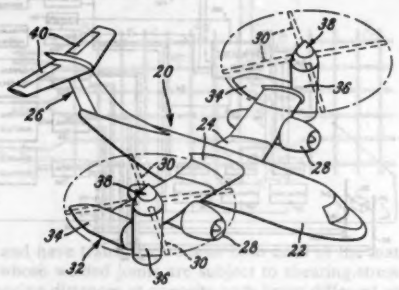
3,592,412
CONVERTIBLE AIRCRAFT

Edward W. Glatfelter, Newtown Square, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 3, 1969, Ser. No. 863,721
Int. Cl. B64c *27/22*
U.S. Cl. 244—7 **15 Claims**

A rotor hub assembly for aircraft adapted to hover, climb, and descent like a helicopter, yet also adapted to cruise in the manner of a conventional fixed-wing airplane. The rotor hub assembly includes rotor blades which are movable between extended, operational positions during the hover mode and retracted, inoperative positions during the cruise mode such that they are flush with outer surfaces of their associated nacelles mounted at outer extremities of fixed wings. Upon commencement of the folding sequence, the blades as-

sume feathered positions. A scheduling mechanism controls rotation of the blades about their pitch axes as they are folded and maintains the blades in their feathered positions



until they nearly retracted, at which time the blades are rapidly rotated about their pitch axes to a substantially flat pitch as they settle into associated cavities provided in the nacelles.

3,592,413

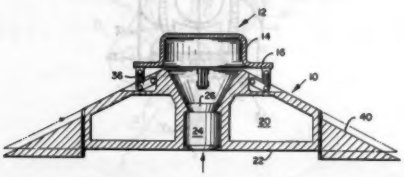
VERTICAL LIFT MACHINE

Raymond V. Thompson, Simsbury, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed June 25, 1969, Ser. No. 836,393

Int. Cl. B64c *29/00*

U.S. Cl. 244—12 **10 Claims**



A maneuverable lifting body wherein pressurized gas is discharged at supersonic velocity over the surface of a downwardly sloping surface, the supersonically flowing gas separating and thereafter reattaching to the surface to provide a low-pressure region intermediate the points of separation and reattachment. The low-pressure region created on the upper surface, in cooperation with atmospheric pressure on the bottom of the body, results in vertical lifting forces which add to the vertical component of the momentum forces of the gas.

3,592,414

VARIABLE CONTOUR AIRCRAFT TAIL CONE ASSEMBLY

Felix Aulehla; Gunter Broll, and Gerhard Kopp, all of Munich, Germany, assignors to Entwicklunzsring Sud GmbH, Munich, Germany

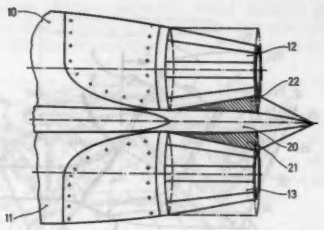
Filed Sept. 27, 1968, Ser. No. 763,110

Claims priority, application Germany, Oct. 2, 1967, P 15 31 399.2

Int. Cl. B64d *29/04*

U.S. Cl. 244—55 **3 Claims**

A tail cone assembly is located between two adjacent variable area engine nozzles. The assembly includes a plurality of panels mounted upon the ventral surface of the tail and located between the nozzles. The panels are provided with means causing their relative moment so as to provide an ad-



justable relatively smooth transition between the exterior surface of the tail and the nozzle.

3,592,415

AIRCRAFT

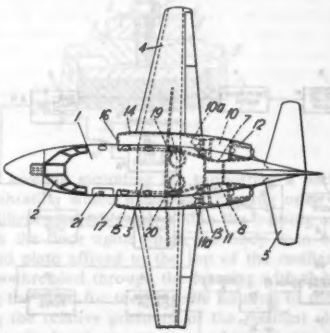
Gerald David Walley, Elksmere, Whittinghan Road, Long Ridge, Preston; Thomas William Smith, 26 Ribley Avenue, Wrea Green, Preston, and Geoffrey Stott, 49 Jepps Avenue, Barton, Preston, all of, England

Filed May 13, 1969, Ser. No. 824,118

Claims priority, application Great Britain, May 14, 1968, 22918/68

Int. Cl. B64c *7/02*

U.S. Cl. 244—55 **4 Claims**



A low wing jet-engined aircraft having at least one aft-mounted engine on each side of the fuselage, and an air intake duct for each engine extending forward of the engine over the wing to an intake mouth positioned adjacent to, or forward of, the wing-leading edge.

3,592,416

VERTICAL TAKEOFF AND LANDING AIRCRAFT

Hans Richard Rikus, Ottobrunn, Germany, assignor to Entwicklungsring Sud GmbH, Munich, Germany

Filed June 3, 1969, Ser. No. 829,965

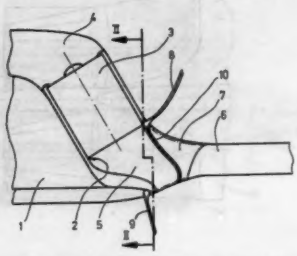
Claims priority, application Germany, June 5, 1968, P 17 56 548.9-22

Int. Cl. B64d *27/20*; B64c *29/04*

U.S. Cl. 244—54 **4 Claims**

A vertical takeoff and landing aircraft having a lift engine positioned within the fuselage adjacent the base of a wing, an intake duct connecting the intake of the engine with the dorsal surface of the fuselage and an exhaust duct connecting the outlet of the engine with the ventral surface of the wing proximate the base thereof. An air duct is included which passes from the upper surface to the ventral surface of the wing and which is in communication with the exhaust duct from the engine. Adjustable doors are provided for selective-

ly obstructing the inlet and outlet orifices of the air duct, and a vane is positioned within the air duct so as to control the



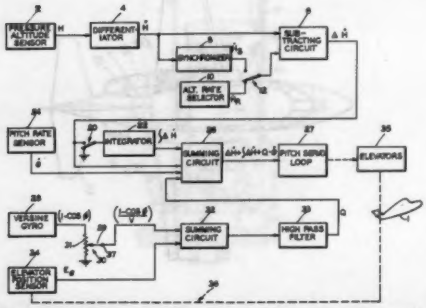
mixing of the gases passing from the engine and flowing through the air duct.

3,592,417

AERIAL RECOVERY SYSTEM FOR AUTOPILOT/FLIGHT DIRECTOR SYSTEM

Arthur Simon, Fairlawn, N.J., assignor to The Bendix Corporation

Filed June 19, 1969, Ser. No. 834,701
Int. Cl. B64c *13/18*
U.S. Cl. 244—77 B **15 Claims**



A flight control system whereby an automatic pilot, or human pilot through a flight director, controls the flight of an aircraft for accomplishing an aerial recovery mission by initially matching aircraft vertical velocity and position with vertical velocity and position of a falling target. Subsequently, fly-by or other loss of target is negated by the system and it directs the human or auto pilot in a controlled air mass turn and descent maneuver to bring the aircraft over the target.

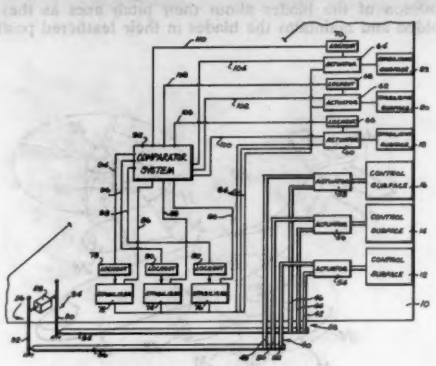
3,592,418

AIRCRAFT STABILITY CONTROL SYSTEM

Derek Wood, Sun Valley, Calif., assignor to Bell Aerospace Corporation

Filed Aug. 8, 1969, Ser. No. 848,552
Int. Cl. B64c *13/40*
U.S. Cl. 244—85 **6 Claims**

An aircraft control system utilizing redundant major control surfaces which are mechanically under pilot control and redundant minor control surfaces for stabilizing the aircraft



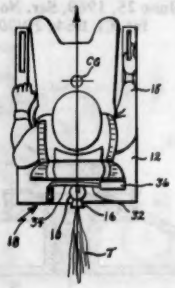
and which are responsive to automatically generated stabilizing signals.

3,592,419

ROCKET TWO-WAY CENTERING BUNGEE

Ralph E. Hantzsch, Los Alamitos, Calif., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Dec. 10, 1969, Ser. No. 883,709
Int. Cl. B64d *25/10*
U.S. Cl. 244—122 **3 Claims**



Stabilization system for preventing rotation of a pilot seat and its occupant which becomes operative only after ejection and when it is in the air and free from the air or space craft. A linkage system set up between a gyro and the rocket motor duct keeps the direction of rocket thrust aligned with the center of gravity of man and seat. The gyro is sensitive to both clockwise and counterclockwise motion. When a yaw or spinning motion begins to take place the gyro, operating through a linkage system, rotates the rocket duct either clockwise or counterclockwise, as demanded by the gyro, to change the direction of rocket thrust to counteract the spin.

The linkage system comprises a harness or frame secured to the center of the rocket duct system, and two links to connect the gyro to the harness and effect limited rotary movement of the duct system. One of the links has slidable connection to, and operates against the spring of a bungee element.

3,592,420

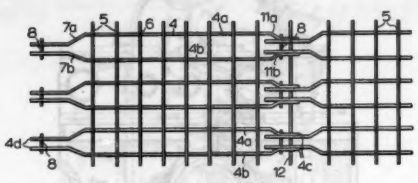
MAT FOR LINING BEAMS IN MINE CONSTRUCTIONS

Hans Reiter, Pestalozzistrasse 23, 4354 Datteln, Germany

Filed Apr. 28, 1969, Ser. No. 819,661
Claims priority, application Germany, May 7, 1968, P 17 58 284.2
Int. Cl. E01c *5/16*
U.S. Cl. 245—9 **2 Claims**

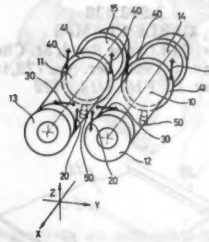
The disclosure relates to a wire mesh mat intended for the lining of supporting beams in mine roadways and tunnel con-

structions, and consisting of mat sections each having longitudinal and transverse rods welded together at their intersection points, the longitudinal rods having hooks at their ends, while the longitudinal rods are assembled together in



pairs and have transverse rods at both ends of the mat section, whose welded joints are subject to shearing stress, but the spacing distances at opposite ends being different so that the mat sections can be successively interengaged with each other.

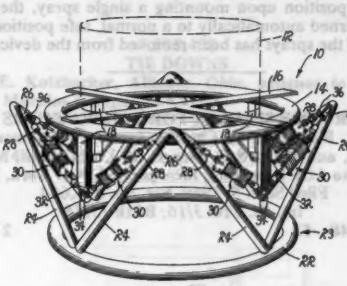
3,592,421
APPARATUS FOR MOUNTING JET ENGINES
Gerhard Kopp, Munich, Germany, assignor to Entwicklungsring Sud GmbH, Munich, Germany
Filed July 1, 1968, Ser. No. 741,591
Claims priority, application Germany, July 18, 1967, E 34 414 XI/62b
Int. Cl. B64d *27/00*
U.S. Cl. 248—5 **11 Claims**



A mounting apparatus for supporting the jet engines of a vertical takeoff and landing aircraft. The engine is supported by mounting rods which are oriented in planes normal to each other. Supporting the engine rearwardly of the mounting rods are thrust pins which include locking means to prevent their accidental loosening. The rods and thrust pins are retained in their desired positions after removal of the engine to facilitate maintenance of the engine and remounting.

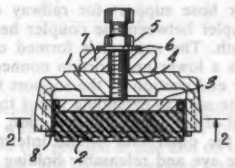
3,592,422
VIBRATION ISOLATION SYSTEM USING COMPRESSION SPRINGS
T. O., Administrator of the National Aeronautics and Space Administration in respect to an invention of Paine, and Robert M. Norman, Glendale, Calif.
Filed July 29, 1969, Ser. No. 845,807
Int. Cl. F16f *15/06, 3/00*
U.S. Cl. 248—18 **8 Claims**

A vibration isolation system for isolating loads from the effect of vibrational forces transmitted to supporting structures, either from the load or from the environment, particularly suited for isolating loads from the effects of vibration normally encountered in test operations performed in environmental test chambers, and further characterized by a plurality of suspension members, each of which includes a pair of coaxially arranged, helical compression springs so mounted as to be separately subjected to compression as the suspension members are subjected to tension, whereby a test object may be supported for operation substantially free from



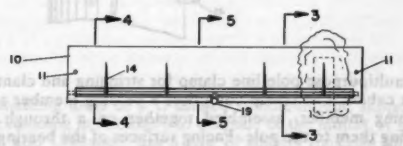
the effects of environmental vibration through an employment of a system of minimal bulk and complexity.

3,592,423
LEVELING MOUNTING
Billy Y. K. Mui, Astoria, N.Y., assignor to Korfund Dynamics Corporation, Westbury, N.Y.
Filed Sept. 12, 1969, Ser. No. 857,318
Int. Cl. F16f *15/00*
U.S. Cl. 248—24 **2 Claims**



A resilient leveling mounting for supporting a body and minimizing vibration which includes a housing open at the bottom, a resilient element partly within the housing and engageable with the floor upon which the body is to be supported, a rigid plate affixed to the top of the resilient element, a screw threaded through the housing with the lower end engaging the plate for securing the housing to the body and adjusting the relative positions of the resilient element and the housing for leveling purposes, and a friction coupling between the housing and the resilient element which retains the resilient element within the housing but permits relative movement for leveling the body or replacing the resilient element.

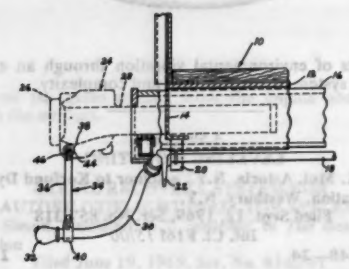
3,592,424
SPRAY HOLDERS
Joseph C. Hargrave, 925 Greenwood, Hot Springs, Ark.
Filed July 22, 1969, Ser. No. 843,623
Int. Cl. A47g *7/00*; A47f *5/08*
U.S. Cl. 248—27.8 **3 Claims**



A flower spray holding device for use in the holding room of a funeral home, said holding device comprising a backboard adapted to be mounted to the wall of the holding

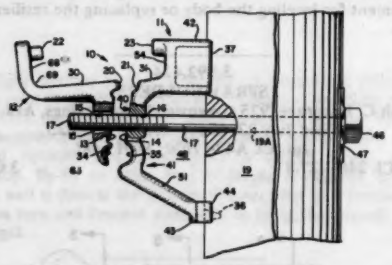
room, said device also including a multiplicity of spikes for receiving a block of styrofoam around which funeral sprays are built, said spikes being normally folded upwardly against said backboard by spring action and held outwardly in a receiving position upon mounting a single spray, the spikes being returned automatically to a normal, safe position when the last of the sprays has been removed from the device.

3,592,425
AIR HOSE SUPPORT FOR RAILWAY CARS
Robert W. Randolph, St. Charles; James C. Hammonds, St. Charles, and Richard H. Dugge, St. Louis, all of, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.
Filed Sept. 5, 1969, Ser. No. 855,654
Int. Cl. F16l *3/16*; B61h *13/38*
U.S. Cl. 248—53 2 Claims



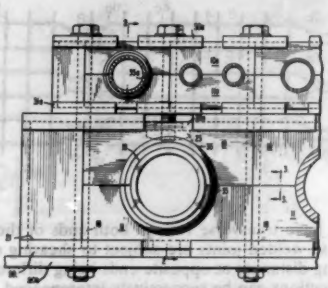
A resilient air hose support for railway cars extending beneath the coupler between the coupler head and the air hose therebeneath. The support is formed of a rubberlike material and has a lower end portion connected to the air hose. The lower end portion of the support has a relatively wide intermediate section extending about the hose, an eye adjacent one end of the intermediate section, and a protuberance adjacent the other end of the intermediate section fitting within the eye and releasably holding the support in position about the circumference of the air hose.

3,592,426
MULTIPURPOSE POLE LINE CLAMP
George A. Dubey, Branford, and Edwin C. Taylor, New Haven, both of, Conn., assignors to MIF Industries, Inc., Branford, Conn.
Filed Feb. 18, 1969, Ser. No. 800,100
Int. Cl. F16l *3/10*
U.S. Cl. 248—67.5 7 Claims



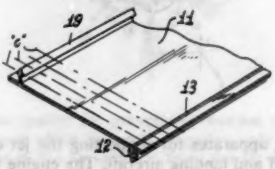
A multipurpose pole line clamp for stringing and clamping utility cables. The clamp comprises a bearing member and a clamping member, assembled together on a through bolt securing them to the pole. Facing surfaces of the bearing and clamping members cooperate to clamp a messenger cable securely anchored in its installed position alongside each pole. Each member incorporates a trunnion support post, and these posts engage and secure a stringing block during installation of the utility wire.

3,592,427
ADAPTABLE MODULE, CONDUIT AND TUBE SUPPORT
Louis J. Misuraca, 1359 Romulus Drive, Glendale, Calif.
Filed Jan. 9, 1969, Ser. No. 790,039
Int. Cl. F16l *3/22*
U.S. Cl. 248—68 8 Claims



The invention consists primarily of an adaptable module, conduit and tube support system which, in turn, provides the foundation for the many conduits, tubes and other carriers employed in the distribution of gases, fluids, semisolids or other media as may need to be transported under various pressures and temperatures; to provide such support in efficient, workmanlike manner by utilizing structure of minimum weight and high strength ratio in the form of basically channel-shaped modules employing conduit straddling yoke portions; the same being securely retained and aligned in fixed locating rails and substantially immobilized therein by appropriate fastening elements.

3,592,428
CABLE CLAMPS
Le Roy F. McFarlane, 718 Crane Road, St. Charles, Ill.
Filed Nov. 4, 1968, Ser. No. 773,163
Int. Cl. F16l *3/14*, *3/22*
U.S. Cl. 248—74 7 Claims

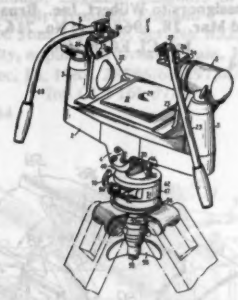


A cable clamp formed of extruded resilient thermoplastic material and having mating elements on one or both faces so as to enable the clamp to be secured about a bundle of wires or the like and/or to a support surface.

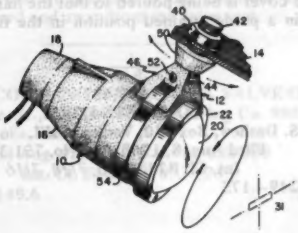
3,592,429
GIMBAL MOUNTING FOR INSTRUMENTS AND MACHINES
Robert Eric Miller, 2 Ian Street, Rose Bay, New South Wales, and Eric Miller, 1 Wharf Road, Vaucluse, New South Wales, both of, Australia
Filed Mar. 5, 1969, Ser. No. 812,531
Claims priority, application Australia, Mar. 6, 1968, 34644/68
Int. Cl. F16m *11/12*
U.S. Cl. 248—179 4 Claims

A gimbal mounting for instruments used on unstable bases such as aircraft, boats or vehicles includes a U-shaped base mounted on a support and a U-shaped cradle swingably mounted on the base. The base mounting comprises two interconnected units disposed one above the other each including pistons rotatably mounted in liquid filled cylinders, the longitudinal axes of the pistons being coplanar and at right angles to each other. The lowermost of the two units is cou-

pled to a support such as a tripod, whereas the uppermost unit is secured to the underface of the base bottom. Exteriorly adjustable brake means are disposed within the cylinders for engagement on the peripheries of the pistons.

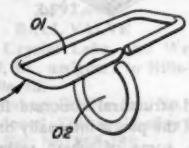


3,592,430
STRAP SWIVEL MOUNT
Peter M. Coombs; N. H. Newton, and George D. Lawson, all of Georgetown, Mass., assignors to Sylvania Electric Products Inc.
Filed Oct. 16, 1969, Ser. No. 866,977
Int. Cl. B60q *1/00*
U.S. Cl. 248—289 **2 Claims**



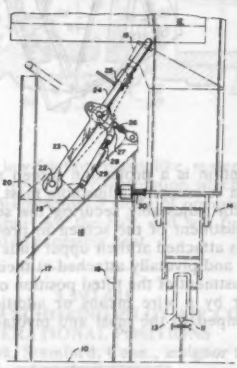
The invention involves an adjustable mounting arrangement for an automotive accessory driving light having a cylindrical shape. The mounting can be disposed on most any irregular surfaces and thereafter the light can be adjusted to produce a light pattern that conforms with acceptable safety light spreads.

3,592,431
HANGER SUPPORT APPARATUS
Enrico P. Daldone, 201 E. 42nd St., New York, N.Y.
Filed Apr. 9, 1969, Ser. No. 814,683
Int. Cl. A47q *29/00*
U.S. Cl. 248—302 **1 Claim**



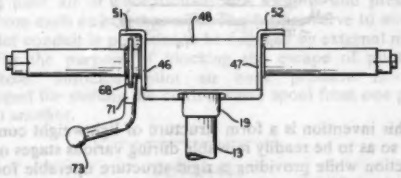
Apparatus for supporting a plurality of hangers, for example coat hangers, displaced vertically from each other such that the amount of hanger rack space required for a given number of hanger supported items (e.g. clothes) is reduced, and such that the hanger supported items are more readily observable. Such apparatus including an improved hanger having structure integral therewith for supporting a second hanger displaced vertically therefrom, and also including a discrete hanger support for use in cooperation with two hangers whereby such two hangers are displaced vertically with respect to each other.

3,592,432
TIE DOWNS
Robert E. Kotzbacher, Alliance, Ohio, assignor to The Alliance Machine Company
Filed July 9, 1969, Ser. No. 840,407
Int. Cl. B65j *1/22*
U.S. Cl. 248—361 **7 Claims**



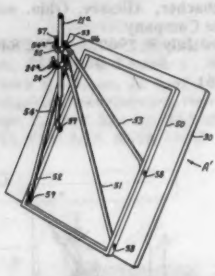
A tiedown mechanism is provided for holding an object to a surface having a first link means pivoted at one end to said surface, a tiedown rod pivoted at one end on the other end of said first link means, and having engaging means on the other end engaging the object to be held and extensible means pivoted at one end on the surface and at the other end adjacent the pivotal connection between said first link means and said tiedown rod.

3,592,433
TORSION BAR CHAIR CONTROL
Peter A. Fuhrman, Waterloo, Ontario, Canada, assignor to Bliss & Laughlin Industries, Incorporated, Oak Brook, Ill.
Filed Feb. 25, 1969, Ser. No. 802,021
Int. Cl. A47c *3/023*
U.S. Cl. 248—373 **7 Claims**



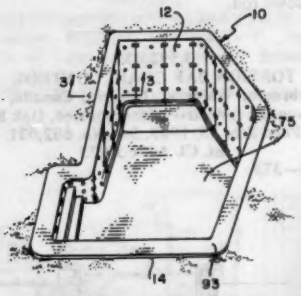
Upstanding arms of a U-shaped spindle-mount, support a tube extending horizontally to one side of the mount. A main frame, also U-shaped, has a pair of spiders rockable on the tube and associated with another tube through a tensioning arm and adjustment screw. The tubes are end-to-end, separated by a bushing, and receive a torsion bar therethrough, the outer end of each tube being crimped onto the opposite square ends of the torsion bar.

3,592,434
PROJECTION SCREEN APPARATUS
Louis Daniel Murray, 5216 Ponderosa Way, Dallas, Tex.
Filed Dec. 26, 1967, Ser. No. 693,477
Int. Cl. G03b 21/56
U.S. Cl. 248—480 6 Claims



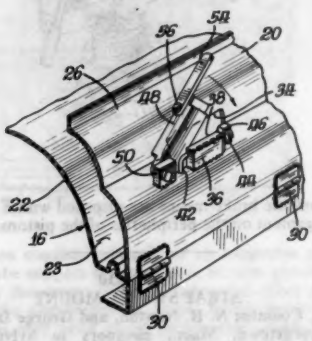
This invention is a projection screen apparatus basically comprising a telescoping adjustable mast, and a bracket arrangement for adjustably securing the screen to the mast. Vertical adjustment of the screen in provided by divergent support arms attached at their upper ends to a clamp slidable on the mast and pivotally attached at their lower ends to the screen. Adjustment of the tilted position of the screen is provided either by a wire means or additional support arms slidably clamped to the mast and pivotally attached to the screen.

3,592,435
FORM STRUCTURE
Charles D. Mattingly, Wichita, Kans., assignor to Mattingly, Inc., Wichita, Kans.
Filed Sept. 9, 1968, Ser. No. 758,255
Int. Cl. E02b 1/00
U.S. Cl. 249—1 4 Claims



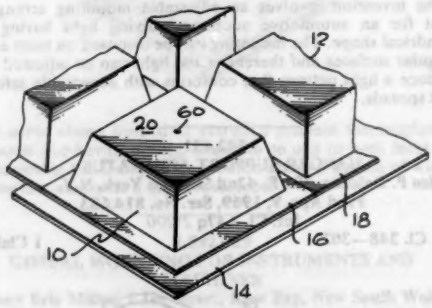
This invention is a form structure of lightweight construction so as to be readily movable during various stages of construction while providing a rigid structure operable for construction of concrete walls without warpage. More particularly, this invention is a form structure including (1) a main body of vinyl foam core having exposed surfaces covered by layers of fiberglass material and the concrete contacting surface provided with a Black Gel coat of polyester resin, (2) upright edges provided with interlocking joint members whereupon adjacent form structures can be secured to each other through the use of latch and hook assemblies; and (3) a plurality of horizontally extended ty-hole assemblies are provided for interconnecting adjacent, cooperating front and back form structures in a spaced relationship for pouring concrete or like materials therebetween.

3,592,436
BURIAL VAULT MOLD WITH HANDLE POSITIONING MEANS
Wesley Miles Chandler, and Paul Fred Heuser, both of Saint Paul, Minn., assignors to Wilbert, Inc., Broadview, Ill.
Filed Mar. 28, 1968, Ser. No. 716,806
Int. Cl. E04h 3/00
U.S. Cl. 249—94 6 Claims



A burial vault cover mold having fixture means associated therewith for holding a plurality of cover handles in place while the cover is being poured so that the handle will be imbedded in a predetermined position in the finished molded article.

3,592,437
CONCRETE FORM
Stephen S. Dashew, Box 630, Venice, Calif.
Filed Aug. 8, 1968, Ser. No. 751,307
Int. Cl. B28b 7/06, 7/28, 7/16
U.S. Cl. 249—175 5 Claims



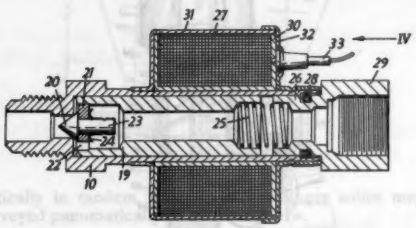
A pan-shaped structural concrete form wherein the top and each side of the pan is internally braced by a framework of metal tubes, some of which serve as hand holds for removal of the pan. In pans with flanges, the flanges are of flexible construction and are molded with a definite angle from the horizontal, so they become horizontal when the pan is turned upside down and pressed down by the weight of concrete. Other pans without flanges employ a lock-in rubber strip at the bottom to form a seal with the construction deck on which the pans are laid.

3,592,438

SOLENOID VALVES

Greenwood, Thomas Eric, and Farnfield, Ronald Edward, both of Plymouth, England, assignors to Tecalemit (Engineering) Limited, Plymouth, England

Filed June 13, 1969, Ser. No. 832,895
Claims priority, application Great Britain, June 14, 1968, Dec. 16, 1968, 28586/68;29734/68
Int. Cl. F16k 31/06
U.S. Cl. 251—84 3 Claims



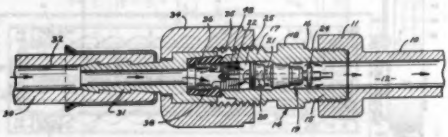
A solenoid-operated valve including an elongated, continuous, fluid conduit having a valve seat adjacent one end and a pole piece adjacent the other. A hollow armature sleeve is slidably disposed in the fluid conduit for movement between the valve seat and pole piece and the sleeve is biased away from the pole piece toward the seat. A solenoid coil is mounted around and exteriorly of the fluid conduit offset longitudinally of the pole piece and a self-centering valve member is carried at the end of the armature sleeve for movement toward and away from the valve seat.

3,592,439

FLUID LINE COUPLING WITH CHECK VALVE OPENER

John R. Ritchie, Jr., c/o Ritchie Engineering Co. 999 E. 79th St., Minneapolis, Minn.

Filed Aug. 15, 1969, Ser. No. 850,533
Int. Cl. F16l 37/10, 37/28
U.S. Cl. 251—149.6 3 Claims



An inflation valve coupling wherein the valve-opening element in the female-coupling member is threaded into a surrounding sealing gasket of resilient material to securely position the element and enable axial adjustment thereof for opening engagement with inflation valve stems of varying axial positions within their valve housings.

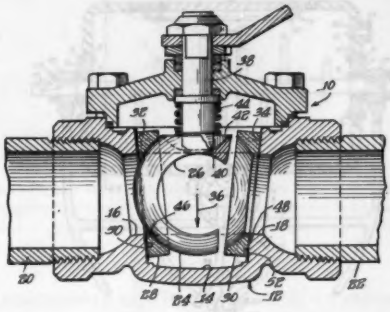
3,592,440

BALL VALVE

Rolland McFarland, Crystal Lake, and Werner K. Priese, Barrington, both of, Ill., assignors to Hills-McCanna Company, Carpentersville, Ill.

Continuation-in-part of application Ser. No. 573,121, Aug. 17, 1966, now abandoned. This application Oct. 16, 1969, Ser. No. 868,289
Int. Cl. F16k 25/00, 5/20
U.S. Cl. 251—170 9 Claims

A ball valve of the type wherein the flow control ball member is supported by valve seats and is free to "float" in the sense that it can move axially under fluid pressure and transversely of its axis under either mechanical or fluid pressure. This latter transverse movement is employed in conjunction with and relative to the support means for the seats to maintain the seats in firm sealing contact with the ball surface. To facilitate the maintaining of sealing contact, and to permit unrestricted free movement of the seats, the respective contiguous surfaces on said seats and said support means



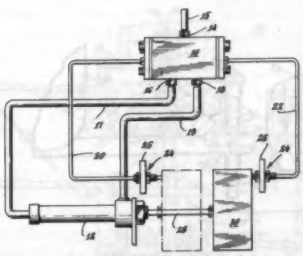
are defined by a low-friction plasticlike material. Further, there is provided a novel seat construction which, in addition to attaining the aforementioned mode of operation, provides increased load support for the ball, and will function when the valve is exposed to excessive heat.

3,592,441

FITTINGS FOR ANCHORING PILOT AIR CONDUIT IN OPERATIONAL POSITIONS

Miroslav J. Piroutek, Stamford, Conn., assignor to Self-Matic Valves Corporation, Stamford, Conn.

Filed Apr. 23, 1969, Ser. No. 818,627
Int. Cl. F16k 25/00
U.S. Cl. 251—364 9 Claims



The disclosed fittings are used in conjunction with back pressure actuated control valves having pilot conduit for conveying pilot air of exceptionally low volume and pressure bled from each end of the valve. The fittings serve to anchor the pilot conduit in positions to be engaged by external members for the purpose of blocking the escape of pilot air therefrom. Sufficient pilot air back pressure is thus developed for shifting the control valve spool from one position to another.

3,592,442

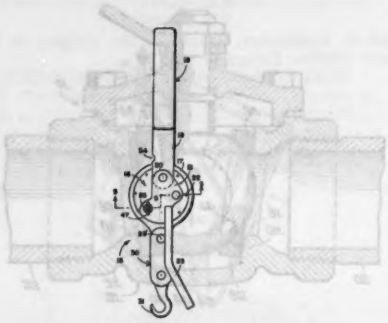
DEVICES TO APPLY TENSION IN A CABLE, CHAIN OR ROPE

Frank Zumbo, 1938 E. 1st St., Brooklyn, New York, N.Y.

Filed Nov. 25, 1968, Ser. No. 778,698
Int. Cl. B66f 3/00
U.S. Cl. 254—77 11 Claims

The distal ends of the tines of an elongated clevis straddling a wheel journaled in a peripheral ring, are pivotally linked to the wheel on an eccentric axis pin extending therethrough. A plate in front of one tine, secured to the wheel on said pin, and by another pin, has an elongated handle extending therefrom. Said plate carries a spring latch.

The bight of the clevis and a radial lug extending from said ring, each have a releasable attachment means for interposing the device in a spanned cable, chain or rope. When the handle is moved to turn the wheel a partial rotation in one direction, the device will contract, the clevis will be stopped



at a position a bit past dead center, and said tine will cam the latch into a position to lock the clevis. To bring the device to extended condition after such immobilization, the latch is pulled by hand to clear the said tine, and the handle is turned in the opposite direction.

3,592,443

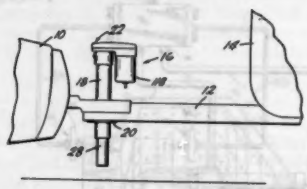
ELECTRIC JACK

Jack C. Budrow, and Glenn A. Reed, both of Battle Creek, Mich., assignors to H & H Engineering Division, Battle Creek, Mich.

Filed July 29, 1969, Ser. No. 845,698

Int. Cl. B60s *9/08*

U.S. Cl. 254—86 **8 Claims**



A jack powered by a reversible electric motor preferably for use with trailers for the support of the trailer tongue. The jack includes a column telescopically received within a supporting tube utilizing a threaded shaft and nut system to extend the column. The electric motor is connected to the shaft by means of a speed-reducing transmission incorporating a slip clutch responsive to predetermined torque operative upon the column reaching its extremes of movement to prevent stalling and stressing the motor and transmission.

3,592,444

MIXING APPARATUS

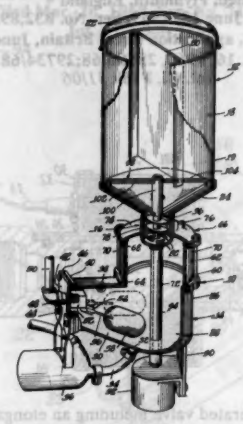
Kostas Savas Arvanitakis, Chicago, Ill., assignor to George Goutos, Chicago, Ill., a part interest

Continuation of application Ser. No. 689,451, Jan. 17, 1968, now abandoned. This application Sept. 15, 1969, Ser. No. 858,191

Int. Cl. B01f *5/00, 7/20, 15/04*

U.S. Cl. 259—4 **6 Claims**

The instant mixing apparatus includes a vessel for holding particles of a solid material, a beater positioned in the lower portion of the vessel and an apertured plate positioned below the beater. An auger connected to the beater and mounted above the plate positively displaces the particles from the vessel through the apertured plate into a basin positioned below the apertured plate. The basin holds a liquid and receives the powdered material. A drive is positioned below



the basin and extends through the basin and is connected to the auger to drive the auger and beater simultaneously.

3,592,445

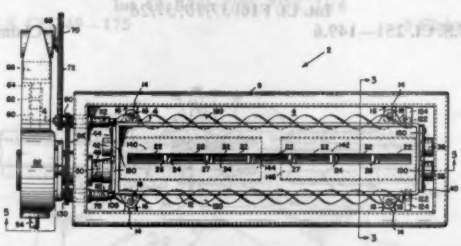
GELATIN DIP POT

Alten E. Whitecar, Westville, N.J., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed Nov. 26, 1968, Ser. No. 779,180

Int. Cl. B01f *7/02*; **B29b** *1/10*

U.S. Cl. 259—6 **8 Claims**



A conventional gelatin dip pot for making capsules having a dip tank suspended in a reservoir tank and a gear pump drawing from along the length of the reservoir tank to supply the dip tank is provided with means having a single inlet opening to provide for the supply of gelatin from a single location in the reservoir tank and is provided with longitudinal helical mixing paddles mounted in the reservoir tank along side the dip tank.

3,592,446

METHOD AND APPARATUS FOR CONTINUOUS BLENDING OF GRANULAR MATERIALS

Max Leva, 1030 Dallet Road, Pittsburgh, Pa.

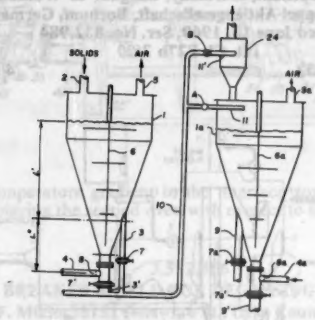
Filed May 19, 1969, Ser. No. 825,570

Int. Cl. B01f *7/18*

U.S. Cl. 259—67 **9 Claims**

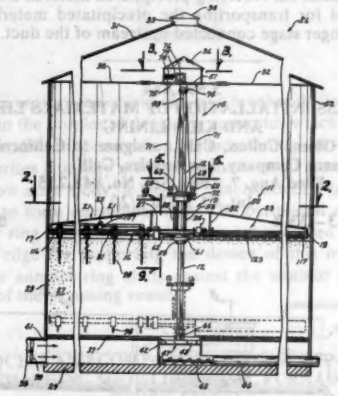
This invention relates to a method and apparatus for continuous blending of granular materials having the same or different particle size or density, comprising one or more containers tapered downwardly and inwardly, each having a stirrer rotatable about a vertical axis for stirring the granular

material at the same time air is passed therethrough. Two or more stages in series may be arranged, either side-by-side or



vertically in tandem, between which stages solids may be conveyed pneumatically or by gravity flow.

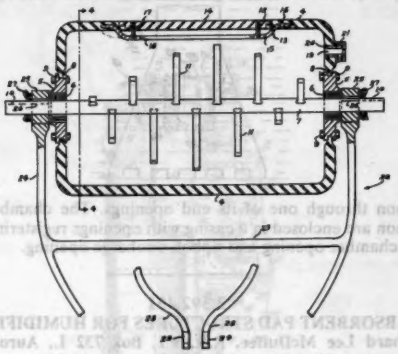
3,592,447
APPARATUS FOR HANDLING AND CONDITIONING GRAIN
Sylvester L. Steffen, 264 S. Walnut, New Hampton, Iowa
Filed Sept. 12, 1969, Ser. No. 857,417
Int. Cl. B01f 7/24
U.S. Cl. 259—102 **15 Claims**



Apparatus for leveling, stirring, and unloading granular material from a circular bin wherein an upright post is centrally mounted in the bin. A yoke is mounted on the post for vertical and rotational movement and rotatably supports a horizontal support member. Stirring bits which are inclined forwardly and downwardly are mounted on the support member. A horizontally disposed leveling and unloading means is also mounted on the support member. At least a portion of the support member can be rotated to lift the stirring bits from the grain.

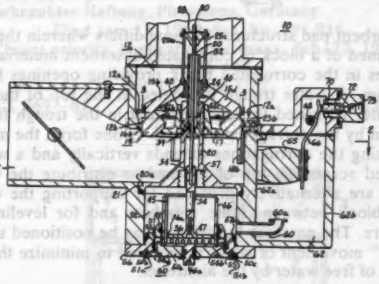
3,592,448
GROUND ACTUATED DRUM FOR MAKING BATCH OF CONCRETE SLURRY
Karl F. Stevenson, 2680 Camino Place West, Kettering, Ohio
Filed Aug. 28, 1969, Ser. No. 853,872
Int. Cl. B28c 5/22
U.S. Cl. 259—153 **1 Claim**

A cylindrical rubber drum containing a "fast fix" cement and water in proper proportion and having metal ends for receiving ball bearings. A stationary shaft passes through the drum and a towing hitch is applied to the shaft. An inert gas is introduced into the drum either from a tank under pressure or by encapulation to take up the ullage space caused by the shrinkage of the concrete mix. Paddles are mounted on the shaft so that as the drum is towed at a fast clip toward a



damaged runway, the mixture is churned into a slurry of proper consistency and can be used immediately in leveling and hardening the fill which previously been dumped into the crater.

3,592,449
FUEL-CONTROLLING DEVICE
Kirrillos B. Elgohary, Pittsburgh, Pa., assignor to Energy Transmission Corp.
Filed Aug. 5, 1968, Ser. No. 750,175
Int. Cl. F02m 9/02
U.S. Cl. 261—36 **1 Claim**

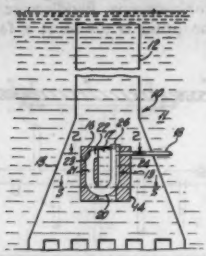


An air valve is disposed in the air flowing through a carburetor to the intake manifold of an internal combustion engine. A fuel valve controls the fuel flow to a mixing chamber which produces a suspension of fuel particles which are entrained in the airflow. The air valve is operably connected to the fuel valve through the mixing chamber.

3,592,450
FLUID CIRCULATOR
George Maxwell Rippon, Apple Trees, Smarden, Kent, England
Filed Dec. 3, 1968, Ser. No. 780,722
Int. Cl. B01f 3/04
U.S. Cl. 261—123 **10 Claims**

A liquid-circulating device includes a vertical stack submerged in liquid and provided with a large bubble generator adjacent its bottom opening. The bubble generator comprises an open bottomed gas chamber and an inverted tubular siphon including a first vertical leg communicating with the upper part of the chamber, a second leg extending upwardly to a bubble discharge opening above the chamber, and a

curved elbow located above the chamber opening. A tubular member is provided for guiding a cleaning tool into the



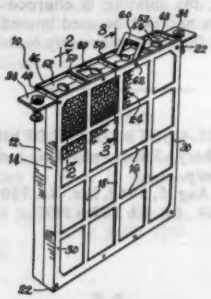
siphon through one of its end openings. The chamber and siphon are enclosed in a casing with openings registering with the chamber opening and siphon discharge opening.

3,592,451

ABSORBENT PAD STRUCTURES FOR HUMIDIFIERS

Richard Lee McDuffee, R.R. #1, Box 732 L, Aurora, Ill.

Filed Mar. 12, 1969, Ser. No. 806,548
Int. Cl. B01f 3/04
U.S. Cl. 261—103 12 Claims



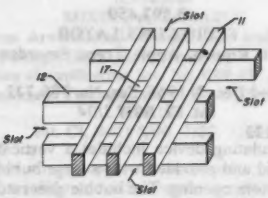
Absorbent pad structures for humidifiers wherein the pads are formed of a block of corrugated absorbent material with passages in the corrugated block providing openings for an airstream. A water trough is located at the top of the pad, and water is passed through openings in the trough for absorption by the corrugated material. In one form, the material forming the corrugations extends vertically and a wick is provided across the top of the pad to distribute the water. Means are alternatively provided for supporting the corrugated block between frame members and for leveling the structure. The passages in the pad may be positioned so that "uphill" movement of water is required to minimize the collection of free water by the airstream.

3,592,452

FLUID-CONTACTING DEVICE

Surinder K. Katyal, Harwood Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 27, 1969, Ser. No. 794,191
Int. Cl. B01f 3/04
U.S. Cl. 261—109 3 Claims



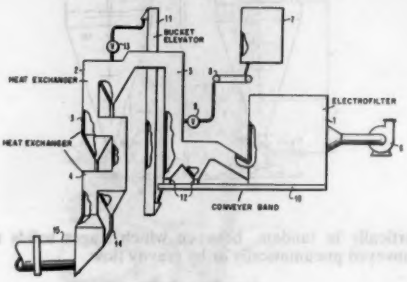
Fluid-contacting device having means associated therewith for varying the open or hole area in a plate element.

3,592,453

SYSTEM FOR DRYING AND PREHEATING FINE-GRAINED MATERIAL, SUCH AS CEMENT RAW MATERIAL PARTICULARLY

Heinz Jager, Bochum, Germany, assignor to Westfalia Dinnendahl Groppel Aktiengesellschaft, Bochum, Germany

Filed June 13, 1969, Ser. No. 832,984
Int. Cl. F27b 7/00
U.S. Cl. 263—32 4 Claims



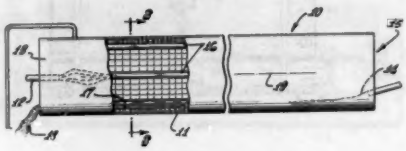
Device for drying and preheating fine-granular material includes an electrofilter, a hot gas supply duct connected to the electrofilter and formed with an advance precipitation chamber, means for supplying fine-granular material directly to the duct for precipitating a portion thereof in the chamber, bucket elevator means adjacent the chamber and the electrofilter for receiving precipitated material from both thereof and for transporting the precipitated material to a heat exchanger stage connected upstream of the duct.

3,592,454

FORMLESS INSTALLATION OF MATERIALS LIFTERS AND KILN LINING

George F. Olsen, Colton, Calif., assignor to California Portland Cement Company, Los Angeles, Calif.

Filed Aug. 7, 1969, Ser. No. 848,235
Int. Cl. F27b 7/20
U.S. Cl. 263—33 R 8 Claims



The disclosure concerns apparatus and methods enabling rapid installation of lining including brickwork in a kiln, and without forms.

3,592,455

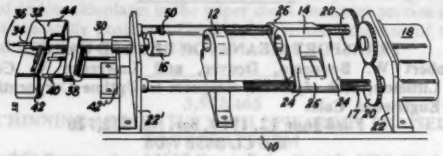
DEVICE FOR THE DISPLACEMENT OF A SOLIDIFICATION SOLID-LIQUID INTERFACE

Jean Gallet, St-Martin D'Heres, and Yves Malmejac, Grenoble, both of, France, assignors to Commissariat a L'Energie Atomique, Paris, France

Filed Nov. 25, 1969, Ser. No. 879,761
Claims priority, application France, Dec. 18, 1968, 178,906
Int. Cl. C22b 41/00
U.S. Cl. 266—24 6 Claims

Device for growing monocrystals of a material comprising an elongated container for the material and two ovens through which the container is circulated. A first oven maintains the position of the material which confronts it at a tem-

perature close to the phase change point. The second oven, located before the first, heats the material to the liquid state.



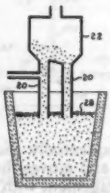
The temperature gradient in the interface zone is stabilized by displacing the second oven with respect to the first.

3,592,456

SLAG BREAKER SHIELD FOR DEGASSING APPARATUS

Louis F. Miklos, 6151 Delaware St., Lake County, Ind.

Filed Jan. 30, 1970, Ser. No. 7,184
Int. Cl. C21c 7/10
U.S. Cl. 266—34 R 6 Claims



This invention is a shield and slag breaker device for application to the nozzles of degassing apparatus which shields the nozzle ends until penetration is made through the slag crust. It comprises a unitary member of sheet metal material having a shallow cone body, a base of which extends radially outwardly to form an annular ring. The peripheral edge of the annular ring is upturned and means are provided on the upturned edge for supporting the device of this invention so that the annular ring abuts against the annular end of the nozzle of the degassing vessel.

3,592,457

PROCESS AND COMPOSITION FOR SEALING AND DISCHARGING METALLURGICAL FURNACES AND OTHER VESSELS

Horace Freeman, Cap de la Madeleine, Quebec, Canada, assignor to Freeman Corporation, Cap-de-La-Madeleine, Canada

Filed Nov. 20, 1968, Ser. No. 777,369
Int. Cl. C21b 7/12
U.S. Cl. 266—42 4 Claims

One aspect of this invention concerns a moldable composition including finely divided, ferro-alloy metallic particles, iron powder, and an inert agent for use in plugging tap holes in furnaces, which composition may be included in an iron pipe for insertion into a tap hole. The invention also concerns a method of removing the contents of metallurgical or similar vessels employing the above compositions by subjecting the tap to a jet or stream of oxygen.

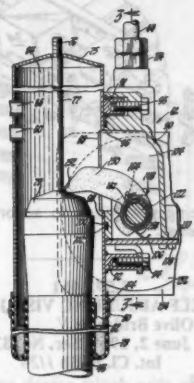
3,592,458

EXHAUST AND RELIEF VALVE ASSEMBLY

George W. Jackson, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 23, 1969, Ser. No. 827,427
Int. Cl. F16f 5/00
U.S. Cl. 267—65 8 Claims

In a preferred form, a valve assembly including an inlet and an outlet. The valve includes an oscillatable, damped shaft and a cam operator member coupled thereto by unidirectional clutch means that couple the sleeve and shaft for concurrent movement in a first direction and decouples the sleeve with respect to the shaft on movement of the sleeve in a second direction. In a first control position, the cam operator conditions a valving element to an open posi-



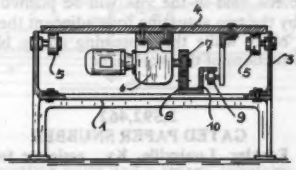
tion so as to communicate the inlet and outlet. In a second control position, the cam operator is positioned to maintain the valve closed. Further, in the second position, the valve includes means responsive to a predetermined pressure at the inlet to open the valving element independently of the cam operator so as to relieve the pressure buildup by communicating the inlet with the exhaust.

3,592,459

LARGE AREA OR CROSS-BEAM CUTTING MACHINE

Werner Golter, and Helmbrecht Muller, both of Pirmasens, Germany, assignors to Firma Schon & Cie. Gesellschaft Mit Beschrankter Haftung, Pirmasens, Germany

Filed Jan. 17, 1969, Ser. No. 791,916
Claims priority, application Germany, Feb. 27, 1968, P 19 86 620
Int. Cl. B23q 5/22
U.S. Cl. 269—61 12 Claims



An improved large area or crossbeam cutting machine comprising a table-guiding frame with a crossbeam, a table movable along the frame and a drive unit therefor, the power takeoff of the drive unit interacting with a longitudinal drive element in which said drive unit is provided on said movable table so as to move in conjunction therewith and said longitudinal drive element is positioned on said table-guiding frame.

3,592,460

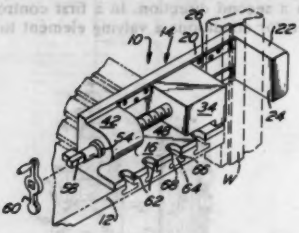
VISE FOR USE WITH MACHINE TOOLS

Willison L. Lower, Camden County, N.J., assignor to Duffield Machine Shop, Inc., Gloucester City, N.J.

Filed Dec. 2, 1968, Ser. No. 780,506
Int. Cl. B23q 3/04
U.S. Cl. 269—101 5 Claims

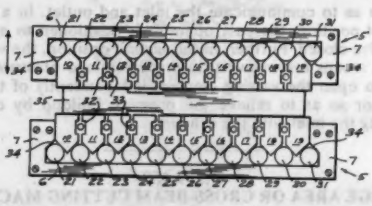
A vice providing vertically oriented gripping surfaces, comprising a base member adapted to be placed at a corner of a supporting surface and having a slide portion and an anvil having a vertically oriented gripping face, and a jaw

coupled to the slide portion and having a vertically oriented gripping face opposed to the gripping face of the base, the



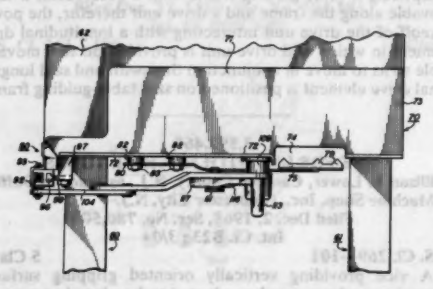
gripping faces being positioned to accommodate vertically elongated workpieces.

3,592,461
SELF-ADJUSTING VISE JAW
Umberto Lauriti, Olive Bridge, N.Y.
Filed June 2, 1969, Ser. No. 829,316
Int. Cl. B25b *1/24*
U.S. Cl. 269—267 **4 Claims**



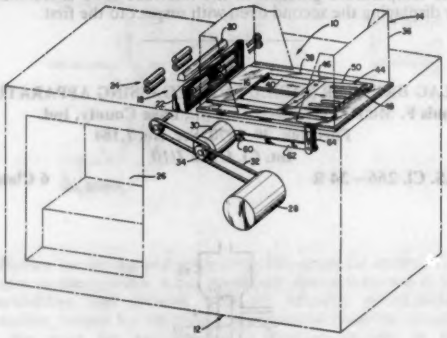
This invention is directed to a self-adjusting vise jaw in which a plurality of laterally aligned clamp blocks are mounted within a frame with their inner ends bevelled to define a series of vertical V-notches within which are freely fitted a corresponding series of actuating rods having a diameter such that portions thereof extend beyond the inner ends of the clamp blocks toward tangential contact with the back of the frame. Any clamp block that faces a thin section of a workpiece held in the vise will be pushed into contact therewith by the two actuating rods adjacent the inner end of the clamp block while the remaining clamp blocks engage the thicker sections of the workpiece.

3,592,462
GATED PAPER SNUBBER
George E. Fackler, Louisville, Ky., assignor to Xerox Corporation, Rochester, N.Y.
Filed July 3, 1969, Ser. No. 838,780
Int. Cl. B65h *3/00, 3/16*
U.S. Cl. 271—18 **9 Claims**



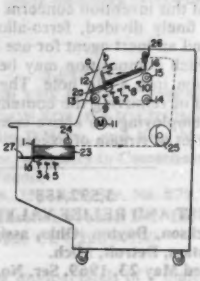
Apparatus to separate individual sheets fed from the top of the stack having a snubber-type stripper arranged to coact with a biased gate to buckle sheets of a first beam strength passing therethrough and to permit sheets of a greater beam strength to pass through the biased gate.

3,592,463
TRANSPORT MEANS FOR RECORD CARDS
Robert W. Bonnema, Denver, and Lawrence V. Cote, Littleton, both of, Colo., assignors to Uptime Corporation, Englewood, Colo.
Filed June 12, 1969, Ser. No. 832,720
Int. Cl. B65h *1/06*
U.S. Cl. 271—44 **14 Claims**



Transport means sequentially picks bottom cards from deck in supply hopper and moves them across platform bottom of hopper into engagement with drive rolls to pass them across the read station of the card reader. Picking means reciprocated by carriage is made of resilient sheet metal with individual fingers extending in direction of reciprocation. Fingers normally extend above platform to engage card deck and yield to its pressure. Pickers at finger ends have detent portions to engage edge of bottom cards to pull them across platform. Detents extend in line perpendicular to fingers to engage major portion of length of card edge and reduce unit loading to avoid tearing or chipping. Pickers and fingers yield individually in bending and torsion to accommodate cards which are bowed either convex or concave to produce maximum engagement.

3,592,464
AUTOMATIC PAPER SHEET ALIGNMENT PLATE POSITIONING DEVICE FOR USE IN PAPER SHEET DISCHARGE SECTIONS OF BUSINESS MACHINES AND THE LIKE
Satoshi Kanda, Yokohama-shi, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Nov. 18, 1969, Ser. No. 877,712
Claims priority, application Japan, Nov. 22, 1968, 43/102,155
Int. Cl. B65h *31/20*
U.S. Cl. 271—86 **1 Claim**



An automatic paper sheet alignment plate positioning device for use in paper sheet discharge sections of business

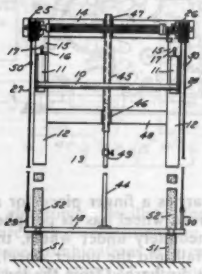
machines and the like in which when an end plate and/or sideplates for alignment of the side edges of paper sheets stacked in the paper sheet feed section are positioned according to the size of the sheets, the similar sheet alignment end and/or sideplates in the paper sheet discharge section are automatically positioned in response to the positions of the end and/or sideplates in the feed section.

3,592,465

CHINNING APPARATUS WITH UPWARDLY BRAISED FOOT PLATFORM

Fred Fulkerson, Jr., 12607 Beech Daly, Detroit, Mich.

Filed Aug. 14, 1968, Ser. No. 752,525
Int. Cl. A63b *1/00*
U.S. Cl. 272—62 **17 Claims**



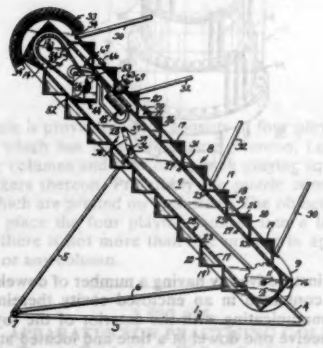
An exercising apparatus for performing chinning exercises including a horizontal bar and a foot platform that is supported by cables and yieldingly urged upwardly to assist the person performing the exercise. Means are supplied for guiding the foot platform for vertical movement.

3,592,466

REVOLVING STEP EXERCISER WITH ADJUSTABLE SLOPE

Billie D. Parsons, Milesville, S. Dak.

Filed Jan. 21, 1969, Ser. No. 792,440
Int. Cl. A63b *23/06*
U.S. Cl. 272—69 **2 Claims**



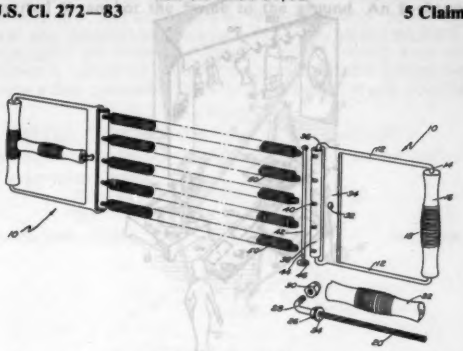
An upwardly and rearwardly sloping treadmill, having steps thereon, mounted in a supporting structure for adjustment of the slope of the treadmill. Fluid pressure means includes a control valve and a pump operatively connected to the treadmill and operated thereby to generate resistance of the treadmill against working force applied thereto by the user.

3,592,467

STRETCHABLE EXERCISER WITH DETACHABLE AUXILIARY HANDGRIP

Lionel C. Pereira, 58 Clyde St., Pawtucket, R.I.

Filed Oct. 31, 1969, Ser. No. 872,932
Int. Cl. A63b *21/02*
U.S. Cl. 272—83 **5 Claims**



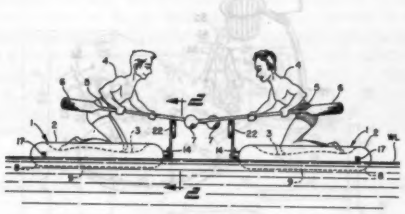
A muscle-building device which adds additional exercises to the conventional stretchable exercising device by the use of uniquely designed handles having transversely positioned handgripping members running parallel to the stretchable members, these handgripping members being detachably connected to the conventional gripping member and the frame to which the stretchable members are attached.

3,592,468

WATER SPORT PLATFORMS

Earl A. Simendinger, Jr., 19500 Euclid Ave., Apt. 681, Cleveland, Ohio

Filed Oct. 30, 1968, Ser. No. 771,719
Int. Cl. A63b *67/00;* **B63b** *7/00*
U.S. Cl. 273—1 **1 Claim**



A pair of jousting poles and a pair of inflatable rafts each raft having a flexible wall for supporting a water sport player in the inflated condition and for collapsing and letting the player down or tipping him into the water in the deflated condition. An escape valve is mounted on the wall of the raft and this valve is connected to an arm supporting a target. When the target is hit by a jousting pole carried by an opposing water sport player, the arm is moved and opens the escape valve causing the raft to deflate and collapse.

3,592,469

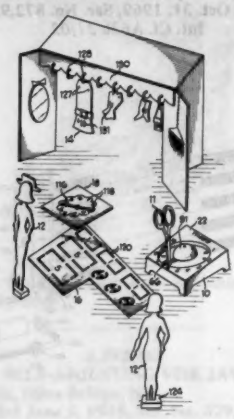
CUTTING GAME WITH TIMER

Marvin I. Glass, and Jeffrey D. Breslow, both of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 10, 1969, Ser. No. 797,928
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 R **4 Claims**

Game apparatus comprising paper sheet material having currency outline markings which may be cut apart for use in purchasing wearing apparel for dressing doll figures. A timing device is provided for limiting the time period during which the player may use the scissors. The timing device includes a

movable pointer and a number of openings for receiving the blades of the scissors. When the blades are inserted into an

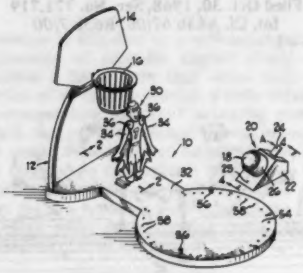


opening, the sound timer is rendered inoperative until they are removed.

3,592,470
BASKETBALL GAME

Jeffrey D. Breslow, Chicago, Ill., assignor to Marvin Glass & Associates

Filed Jan. 12, 1970, Ser. No. 2,336
Int. Cl. A63b *65/12*
U.S. Cl. 273—101 **12 Claims**



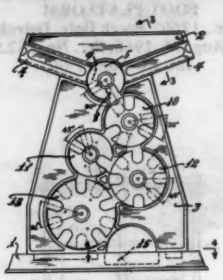
A skill-type game of the type resembling a basketball game having a raised goal or basket, means operable by a first player for propelling a ball toward the basket in an attempt to cause the ball to enter the basket, and a simulated basketball player having arms movable from lower rest positions to raised positions blocking the basket. The arms of the simulated player are actuatable by a second player for movement to their raised positions in an attempt to block the ball preventing it from entering the basket, but the arms return immediately by gravity back to their lower rest positions thereby preventing any control by the second player over the duration of time that the basket is blocked by the arms, thus requiring a degree of timing and coordination.

3,592,471
GRAVITY PROJECTOR GAME DEVICE

Ernest J. Swimmer, New York, N.Y., and Alan A. Hicks, Weston, Conn., assignors to Western Publishing Company, Racine, Wis.

Filed Aug. 6, 1969, Ser. No. 847,888
Int. Cl. A63d *3/02*
U.S. Cl. 273—120 R **4 Claims**

The structure of the Game is an elevated stand having a top section and opposed flat sides below the same. Each side is adapted for play by one or two players, the top section having two chutes for discs or similar playing objects leading to an appropriate one of the sides for progressive reception in peripheral cavities of a succession of manually operated wheels. Each wheel is connected for rotation with a wheel on the opposite side of the elevated stand, and the wheel cavities at one side of the stand are offset from those on the opposite

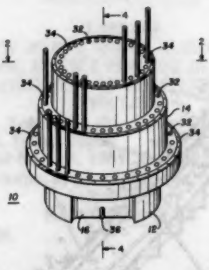


side. Each wheel carries a finger piece for rotation thereof, and when an overhead wheel has its peripheral cavity in register with an immediately under wheel, the disc or allied playing object will fall into the under wheel, and so on until the playing object is discharged from the lowermost wheel. In the embodiment illustrated two chutes are shown at each side of the top section, enabling play by four but two can play, as opposed, one at each side of the stand.

3,592,472
DOWEL DISPENSING AND RECEIVING INSTRUCTIVE TOY

Harry W. Kent, 2306 Scottswood, Garland, Tex.

Filed Aug. 29, 1968, Ser. No. 756,125
Int. Cl. A63f *3/06*
U.S. Cl. 273—135 R **6 Claims**



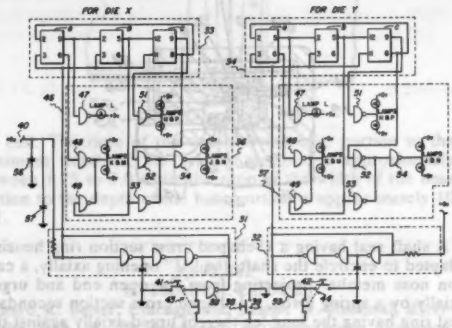
A child's instructive toy having a number of dowels of various colors contained in an enclosed cavity therein, with a channel communicating with the exterior of the toy dimensioned to receive one dowel at a time and located at the bottom of the cavity, and with an ejector pin positioned slidably in the channel; holes arrayed in circles in the wedding-cake-shaped outside surfaces of the top are color coded to correspond with the colors of the dowels, so that dowels may be placed in a hole of corresponding color as they are ejected one by one from the cavity. A mode of play for the toy is provided which involves filing the holes in a predetermined sequence by ejection of dowels one at a time until a dowel of color of a hole to be filled has been ejected.

3,592,473

DICE GAME HAVING TRULY RANDOM NUMBER GENERATION

George Jernakoff, Loudonville; Michael J. Moore, Schenectady, and Donald B. Sorensen, Scotia, all of N.Y., assignors to General Electric Company

Filed Dec. 5, 1969, Ser. No. 882,511
Int. Cl. A63f 5/04; A63b 71/06
U.S. Cl. 273—138 A 4 Claims



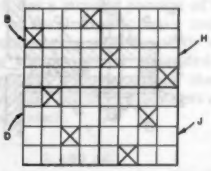
A pair of electronic oscillator/feedback shift register/decoding circuitry combinations are used for a game of dice. Each of these combinations is arranged to randomly generate numbers in six states (1—6) and to independently display the numbers so generated by each combination upon actuation by the player, as by pressing a button. The states prevailing in the separate feedback shift registers upon cessation of pulse input are decoded and displayed to represent the results of a dice throw by the player.

3,592,474

PUZZLE

James R. O'Neil, 1600 36th Ave., San Francisco, Calif.

Filed Mar. 18, 1970, Ser. No. 20,573
Int. Cl. A63f 9/10
U.S. Cl. 273—157 R 3 Claims



A puzzle is provided which consists of four playing squares each of which has 16 small squares thereon, i.e. is divided into four columns and four rows, each playing square having two markers thereon. Preferably the puzzle consists of thin sheets which are printed on both sides. The object of the puzzle is to place the four playing squares into a large square wherein there is not more than one marker in any row, any diagonal or any column.

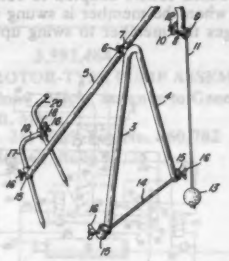
3,592,475

APPARATUS FOR PRACTISING GOLF

Raymond Terry, Tunbridge Wells, England, assignor to Playrite Sportsgear Limited, Tonbridge, Kent, England

Filed Aug. 15, 1969, Ser. No. 850,366
Claims priority, application Great Britain, Aug. 26, 1968, 40626/68
Int. Cl. A63b 69/36, 67/10
U.S. Cl. 273—200 8 Claims

The disclosure is concerned with apparatus for providing driving practice for golfers. The apparatus has a tripod frame in the form of a substantially inverted V-shaped yoke the arms of the V forming two legs of the tripod. The third leg of the tripod is pivoted to the top of the yoke and extends beyond the plane of the yoke as a supporting arm from which a golf ball is suspended at the end of a cord. The lower end of each leg includes a bushing through which a spike may be inserted to anchor the frame to the ground. An L-shaped spike is used to anchor the third leg in position and the laterally extending part of this spike includes another bushing through which another ground anchoring spike may be inserted in nonparallel relation to the L-shaped spike. The ball supporting cord is secured to the supporting arm through a bushing of low friction material having an outer concave end face.

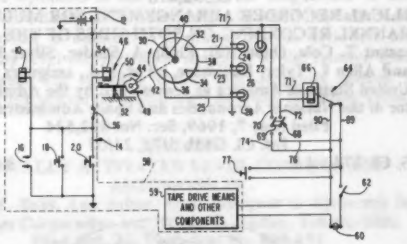


3,592,476

INDICATOR AND SHUTOFF FOR CARTRIDGE-TYPE TAPE RECORDERS

Donald K. MacDonald, 1203 Belknap Court, Cupertino, Calif.

Continuation-in-part of application Ser. No. 657,555, Aug. 1, 1967, now abandoned. This application Feb. 3, 1970, Ser. No. 8,223
Int. Cl. G11b 5/78
U.S. Cl. 274—4 10 Claims



Apparatus for indicating the track being traversed by a magnetic record or playback head of a conventional endless loop cartridge-type tape recorder machine, and for shutting off the recorder machine when the tracks available for recording are exhausted or the cartridge-type recorder has completed its automatic head switching cycle to return the conventional endless cartridge continuous loop to its relative beginning or end, depending on its mode of operation, i.e., record or playback.

3,592,477

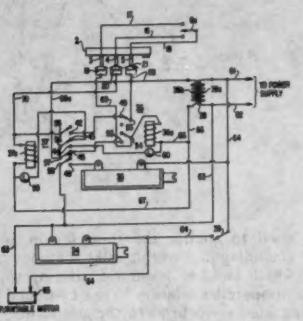
AUTOMATICALLY CORRECT-SPEED TURNTABLES

William M. Winn, 66 Foster Hollow Road, Bradford, Pa.

Filed Sept. 19, 1969, Ser. No. 859,511
Int. Cl. G11b 25/04
U.S. Cl. 274—9 A 10 Claims

A turntable has a hole therethrough at a distance from the axis of rotation greater than the radius of the 45-r.p.m. records and less than the radius of the 33⅓-r.p.m. records. Three concentric annular metal rails insulated from each other and from the turntable are mounted coaxially of the

turntable on the underside thereof. A microswitch is mounted on the underside of the turntable and has an arm extending upwardly through the hole adapted to be depressed by the weight of a low-speed record when placed thereon, the microswitch having a normally closed terminal, a normally open terminal, and a common terminal connected respectively to the three rails. A plastic member is pivoted to a fixed part of the record player below the turntable and carries three metallic rollers adapted to contact the three rails respectively when the member is swung upwardly. A spring yieldably urges the member to swing upwardly, and a sole-



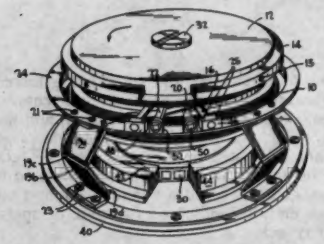
noid is adapted when activated to swing the member downwardly. A relay memory electric circuit is provided including the microswitch terminals, rails, rollers, turntable motor, solenoid, and a source of electric current, also a main switch, whereby when the switch is turned "off" and the turntable is motionless and a record is placed on the turntable, the position of the arm will preset the relay memory circuit according to the diameter of the record, so that when the switch is subsequently turned "on" the rollers will be retracted away from the turntable and the latter rotated at the correct speed for that record.

3,592,478

HELICAL RECORDER ARRANGEMENT FOR MULTIPLE CHANNEL RECORDING ON BOTH SIDES OF THE TAPE

Pleasant T. Cole, Oxon Hill; Philip A. Studer, Silver Spring, and Allen L. Tyler, Baltimore, all of, Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed May 7, 1969, Ser. No. 822,534
Int. Cl. G11b *5/78, 21/02*
U.S. Cl. 274—4 R **8 Claims**



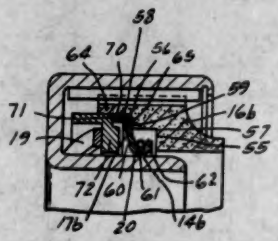
There is disclosed a recorder employing a column of tape wrapped in a helix around a supporting drum. A direct drive torquer rotates the drum-tape assembly. Tape separators and heads are mounted on a traversing system such that they are completely supported by the tape. The separators flex the tape at an angle sufficient to allow the heads to clear the tape stack. As the tape rotates, the archemides screw effect causes the heads to track up and down the tape stack thus traversing the entire length of the tape.

3,592,479

SHAFT SEAL

Raymond H. Andresen, Barrington, Ill., assignor to Gits Bros. Mfg. Co., Chicago, Ill.

Filed Mar. 5, 1969, Ser. No. 804,498
Int. Cl. F16j *15/40, 15/54*
U.S. Cl. 277—40 **1 Claim**



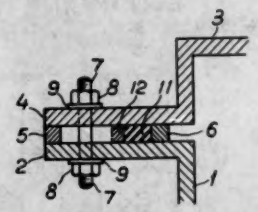
A shaft seal having a U-shaped cross section ring housing adapted to encircle the shaft, the "U" opening axially, a carbon nose member projecting from the open end and urged axially by a spring force, a J-shaped cross section secondary seal ring having the long leg thereof urged axially against the back side of the nose member within the housing and the bight thereof urged radially against the inner diameter wall of the housing, the secondary seal being positioned so as to be urged into greater sealing contact in dependent response to the pressure contained.

3,592,480

ADJUSTABLE GASKET

Robert Koranyi, Ludvika, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Apr. 28, 1969, Ser. No. 819,632
Claims priority, application Sweden, May 2, 1968, 5906
Int. Cl. F16j *15/02*
U.S. Cl. 277—147 **4 Claims**



An adjustable gasket for sealing the space between two flanges which are arranged at a certain distance from each other with the help of a first and a second spacer, comprising a ribbon of elastic material arranged between the two spacers and close to the second spacer, a resilient strip of steel or the like arranged between the first spacer and the ribbon close to the ribbon, a number of pressure means situated between the flanges and arranged to press the strip and the elastic ribbon against the second spacer.

3,592,481

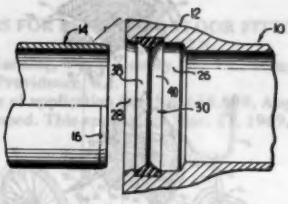
PIPE COUPLING

Warren C. Jeffery, and Sidney P. Teague, both of Birmingham, Ala., assignors to McWane Cast Iron Pipe Co., Birmingham, Ala.

Continuation-in-part of application Ser. No. 529,776, Feb. 24, 1966, now abandoned. This application May 3, 1968, Ser. No. 726,287
Int. Cl. F16j *15/00;* **F16k** *41/00*
U.S. Cl. 277—207 **5 Claims**

This disclosure relates to bell and spigot pipe joints wherein the bell includes an annular recess in which is posi-

tioned an elastomeric sealing member. The sealing member in transverse cross section includes a generally rectangular base portion received in the recess and a generally apex portion projecting radially outwardly beyond an inner surface of



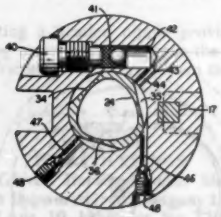
the bell. The ratio of the width of the base portion to the maximum depth of the sealing member is approximately between 1.75 to 3.0 while the ratio of the width of the base portion to the depth of the base portion is approximately 10 to 1.

3,592,482

HYDRAULIC CHUCK

Bernard R. Better, Chicago, and Joseph W. Kosinski, Riverside, both of, Ill., assignors to Scully-Jones Company, Chicago, Ill.

Filed May 27, 1968, Ser. No. 732,408
Int. Cl. B23b *31/30*
U.S. Cl. 279—4 **12 Claims**



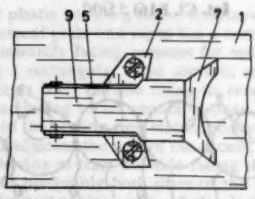
A hydraulic type chuck or holder for receiving and driving a lobed shank of a tool or other operated part, the chuck having a sleeve which has a straight passage of lobed configuration and which is so formed as to have annularly spaced thick wall portions alternating with annularly spaced thinner deformable portions which can be expanded into gripping and centering engagement with the driven shank when fluid pressure is applied to fluid pressure chambers defined in part by the outer side of the shell.

3,592,483

FRONT PORTION OF A SAFETY SKI BINDING

Norbert Pfretschner, Innsbruck, Austria, assignor to Geratebau Huber Kommandilgesellschaft, Major Ellensohnstrasse, Gotzis, Austria

Filed Mar. 17, 1969, Ser. No. 807,664
Claims priority, application Austria, Mar. 15, 1968, 2572/68
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 **4 Claims**



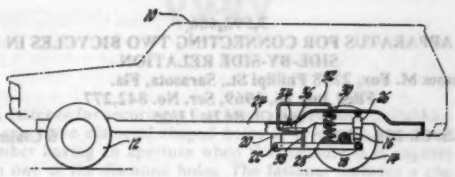
In the front portion of a safety ski binding having a front jaw swingable about a vertical axis, which can be latched into a normal position, there is provided a sole retainer swingable about a horizontal transverse axis, wherein the device for swinging the front jaw about its vertical axis and the device for swinging the sole retainer about its horizontal transverse axis are each mechanically coupled to one another in such a manner that the sole retainer swings upward about its horizontal transverse axis upon the sidewise swinging of the front jaw.

3,592,484

FIXED VANE ROTOR-TYPE PUMP ASSEMBLY

Harold J. Burke, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1969, Ser. No. 880,782
Int. Cl. B60g *11/26*
U.S. Cl. 280—124 **6 Claims**



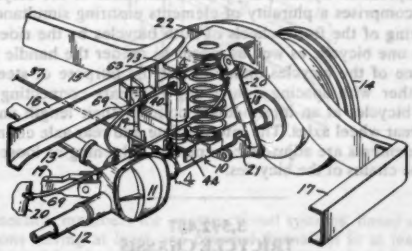
In preferred form, a hydraulic pump for an automotive self-leveling suspension system having a generally cylindrical semiannular rotor within a cylinder in the pump housing. A generally sector-shaped chamber bounded by the semiannular rotor and the pump housing is divided into dual compression chambers by a stationary vane extending from the pump housing toward the rotor. Relative movement between the sprung and unsprung masses of the associated vehicle pivots an arm connected to a shaft which oscillates the rotor within the pump housing. Inlet and outlet valves direct fluid flow from a reservoir into the compression chambers and hence to hydraulic cylinders at the vehicle's rear suspension. A normally closed dump valve between the hydraulic cylinders and the reservoir is opened to depressurize the cylinders and resultantly level the vehicle in response to the relative spacing between the vehicle's sprung and unsprung masses. A cammed surface on the pump shaft actuates the dump valve.

3,592,485

MANUALLY ACTIVATED LEVEL CONTROL FOR AUTOMOBILES

Walter T. Buhl, Ann Arbor, Mich., assignor to Ainsworth Industries Corporation and Harold F. Hadley, Toledo, Ohio

Filed Oct. 22, 1969, Ser. No. 868,471
Int. Cl. B60g *9/02*
U.S. Cl. 280—124 F **8 Claims**



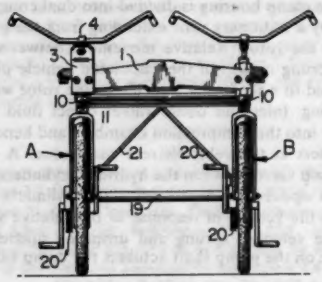
A manually activated level control for an automobile suspension system having pneumatic support means, such as air springs or shock absorbers, and a source of air under pressure which is connected to the support means as necessa-

ry to compensate for changes in vehicle load in order to maintain a predetermined spatial relationship between the sprung body and the axle and wheels. The level control has a manually actuated pushbutton valve which supplies air under pressure to a feeler. The feeler has two relatively movable parts. The base of the feeler is mounted on either the sprung part of the vehicle (i.e., the chassis or body) or on an unsprung part, such as the rear axle, and the other part is extended by the air supplied to the feeler into contact with the other one of the chassis body or axle. If the axle is too close to the chassis, the feeler opens a port which connects the air under pressure to the support means, thus to raise the chassis relative to the axle. If the chassis and axle are too far apart, the feeler opens a port to vent the support means, thus to lower the chassis. Air is fed into or vented out of the pneumatic support means only when the pushbutton valve is actuated and only enough to bring the chassis and body to the desired, nominally "level" position relative to the axle and wheels.

3,592,486
APPARATUS FOR CONNECTING TWO BICYCLES IN SIDE-BY-SIDE RELATION

James M. Fox, 2238 Phillipi St., Sarasota, Fla.

Filed July 16, 1969, Ser. No. 842,277
Int. Cl. B62k *13/06*
U.S. Cl. 280—209 **6 Claims**



The present invention relates to devices for connecting two bicycles in parallel side-by-side relation to permit simultaneous operation by the party seated on either of the bicycles, and comprises a plurality of elements ensuring simultaneous steering of the front wheels of both bicycles by the rider on only one bicycle, as well as means to render the handle bars of one of the bicycles immobile for the purpose of steering together with spacing connecting elements connecting the two bicycles at an intermediate point of their length and at the rear wheel axles. The intermediate and rear axle connecting elements are adjustable to permit tightening or loosening of the chains of the bicycles.

3,592,487
TRICYCLE CHASSIS

Richard C. Mansperger, Peoria, Ariz., assignor to Gobby Mfg., Inc., Glendale, Ariz.

Filed July 25, 1969, Ser. No. 844,747
Int. Cl. B62k *5/04*
U.S. Cl. 280—261 **3 Claims**

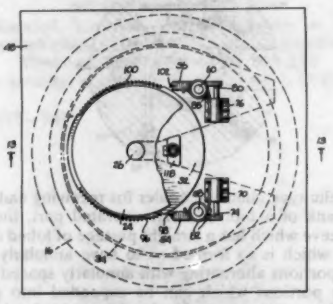
A tricycle chassis arranged for ease of operation of the tricycle, quick and easy changing of the rear tires, and having

a novel basket-and-rear-fender assembly that can be quickly attached and removed from the chassis.

3,592,488
ANTI-JACKKNIFE DEVICE

Robert M. Holloway, 408 Springland Ave, and Robert L. Ludington, Stop 34, Ovneland Beach, both of Michigan City, Ind.

Filed May 22, 1969, Ser. No. 826,806
Int. Cl. B62d *53/10*
U.S. Cl. 280—432 **20 Claims**

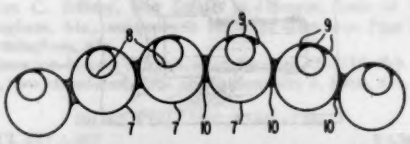


An anti-jackknife device for a "semitruck" including a ratchet device which is arranged and mounted so as to prevent additional articulation when activated, but allows return movement of the tractor and trailer units to their respective in-line positions.

3,592,489
HOUSINGS WITH CONTRACTABLE WELL CASING HANGER SEATS

Benton F. Baugh; Bobby H. Nelson, Houston, Tex., and Carl F. Huntsinger, Ojai, Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.

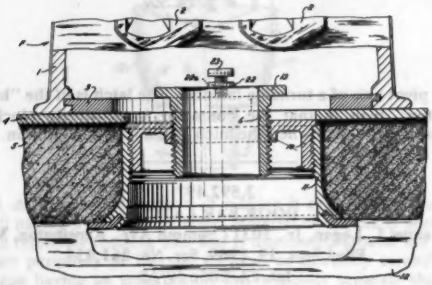
Filed Mar. 17, 1969, Ser. No. 807,730
Int. Cl. F16l *55/00*
U.S. Cl. 285—18 **20 Claims**



A housing having a seat for a casing hanger, which seat is initially in an outer or expanded position to avoid restrictions

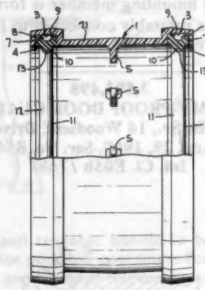
projecting into the housing. Fluid pressure acts on a piston device to effect contraction or constriction of the seat, causing it to project into the housing and serve as a landing shoulder for a casing hanger.

3,592,490
MEANS FOR RENDERING FLOOR FITTINGS NONROTATABLE
William H. Harding, Wood County, W. Va., assignor to Textron, Inc., Providence, R.I.
Continuation of application Ser. No. 658,840, Aug. 7, 1967, now abandoned. This application Mar. 21, 1969, Ser. No. 809,364
Int. Cl. F16l 19/02
U.S. Cl. 285—90 5 Claims



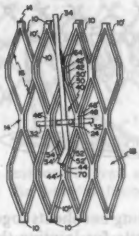
. In a floor fitting a headed nipple provided with means holding a locking screw which engages the fitting base and develops static friction forces to maintain the fitting in fixed position.

3,592,491
PIPE COUPLINGS
John Benjamin Glover, Hazlehead, near Sheffield, England, assignor to The Hepworth Iron Company Limited
Filed Apr. 10, 1968, Ser. No. 720,083
Int. Cl. F16l 21/02
U.S. Cl. 285—230 4 Claims



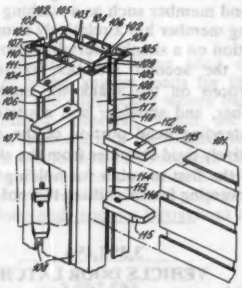
A synthetic plastic coupling sleeve for clayware, pitch-fibre or asbestos-cement plain-end pipes has a corrugation at each end forming inwardly facing recesses for sealing rings, each recess having a rectangular cross section, and each sealing ring comprising a body portion filling its recess except for a portion corresponding to an annular groove of semicircular cross section in the sealing ring midway between the ends of the recess and adjacent the wall of the recess, and an annular sealing head having at least the side facing the outer end of the recess—but preferably both sides of the head—bevelled and spaced from the outer side of the body portion, the volume of the sealing head being appreciably greater than the volume of the groove.

3,592,492
CONSTRUCTION FASTENER
Willard H. Lind, c/o General Matrix Corporation 257 Newtonville Ave., Newton, Mass.
Filed Jan. 3, 1969, Ser. No. 788,875
Int. Cl. F16b 19/00
U.S. Cl. 287—189.35 8 Claims



A fastener for securing a first sheet of expanded metal having repetitive diamond shaped holes to a second, structural member having an aperture when the aperture is in registry with one of the diamond holes. The fastener includes a clip having a loop which is positioned in the registered holes to receive the midportion of an elongated rod disposed lengthwise of the diamond hole and means engageable with the second, structural member for retaining the loop in position. The ends of the rod bear against lengthwise opposed bridges of the hole and the loop is disposed transversely to the rod so that the rod must be bowed to simultaneously bear against the bridges and pass through the loop. The direction in which the rod is bowed forces the expanded metal sheet and structural member together.

3,592,493
CONSTRUCTIONAL SYSTEMS
Alan Charles Goose, Sheffield, England, assignor to Aluminum Systems Limited, Yorkshire, England
Filed May 27, 1969, Ser. No. 828,242
Claims priority, application Great Britain, May 30, 1968, 25,978/68
Int. Cl. F16b 3/00
U.S. Cl. 287—189.36H 6 Claims



Connection members for constructional systems, based on extrusions having at least one channel formation in at least one of the sides thereof, are characterized by having a base member which fits into the channel formation of one extrusion and at least one side member which fits into the channel formation of another extrusion to be connected to the first, securement of the connection member to join the extrusions to draw them together.

3,592,494

A METHOD OF SEWING NET SHEETS TOGETHER

Manivald Maximovich Pajulaid, ulitsa Roo, 10, kv. 6, and Khugo Gustavovich Tooming, ulitsa Gakhu, 8, kv. 24, both of Tallin, U.S.S.R.

Filed Oct. 15, 1968, Ser. No. 767,679
Int. Cl. B65h *69/04*
U.S. Cl. 289—1.5 2 Claims

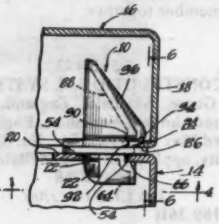
A machine for sewing net sheets together includes a shuttle carrier having a shuttle for jointing thread. A device is provided for pulling a loop out of the shuttle and a device is provided for threading the loop taken therefrom through the meshes of the net sheets. Still further there is provided a mechanism for expansion of the loop and a mechanism for tightening the knot formed as a result of the shuttles passing through the loop.

3,592,495

LATCHING DEVICE

Julian V. Fisher, Carpentersville, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed July 23, 1969, Ser. No. 844,106
Int. Cl. E05c *19/06*
U.S. Cl. 292—76 9 Claims



A latching device molded in one piece from a tough resilient plastic material for securing one member such as a top to a second member such as a washing machine cabinet, which latching member has a relatively strong and unyielding shoulder portion on a shank insertable through and engageable beneath the second member, resiliently collapsible shoulder portions on the shank for engaging behind the second member, and shoulder and abutment means on an outwardly extending head portion of the device positioned over the relatively rigid shoulder from the shank for engaging the flange of the first member for holding the first member down and preventing lateral shifting thereof.

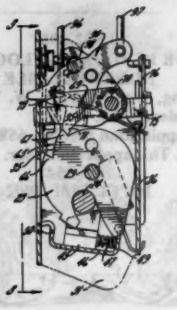
3,592,496

VEHICLE DOOR LATCH

Leonard K. Ploughman, Rockford, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill., Continuation-in-part of application Ser. No. 650,062, June 29, 1967. Continuation-in-part of application Ser. No. 748,124, July 1, 1968, Continuation-in-part of application Ser. No. 751,194, Aug. 8, 1968. This application Sept. 4, 1969, Ser. No. 855,320

Int. Cl. E05c *3/26*
U.S. Cl. 292—216 4 Claims

A single preset latch adapted to be concealed entirely within a vehicle door. The latch includes a pivoted pawl, contactor and locking lever disposed in closely spaced side-by-side relation and mounted to turn about axes which parallel



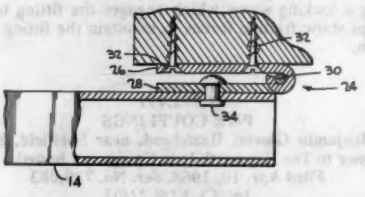
the pivot axis of a turnable latching. The latch is of the "hard button" type in that the contactor is physically blocked against movement when the latch is in a locked condition.

3,592,497

DOOR BAR LATCH

Emanuel L. Logan, Jr., 10317 Summit Ave., Kensington, Md.

Filed Sept. 29, 1969, Ser. No. 861,934
Int. Cl. E05c *19/18*
U.S. Cl. 292—259 3 Claims



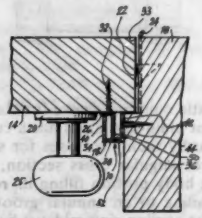
A door bar latch comprising a bar having a mounting member affixed at one end and a slot to receive a keeper at the other end. The mounting member is formed of a pair of hinged plates and is rotatably connected to the bar to permit the bar to pivot along two axes.

3,592,498

JIMMY-PROOF DOOR GUARD

Thomas S. Raccuglia, Sr., 14 Woodsend Drive, Matawan, N.J.

Filed Aug. 29, 1969, Ser. No. 854,099
Int. Cl. E05b *17/00*
U.S. Cl. 292—346 6 Claims



A jimmy-proof door guard comprises an assembly of a channel member and an angle bar. The channel member is secured laterally to a door jamb and the angle bar is secured to the outside of the door. The assembly is located at the height of the lock on the door. When the door is closed, the

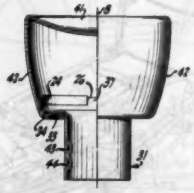
angle bar fits into the channel member so that the bolt of lock cannot be reached and pried open. The channel member and bar are so arranged that the angle bar covers holding the channel member of the door jamb and the channel member covers screws holding the angle bar on the door.

3,592,499

DOOR KNOB AND METHOD OF MAKING THE SAME

Kenneth Raeburn Nelson, West Vancouver, British Columbia; Popel Leslie William, North Vancouver, British Columbia, and Karl Greinacher, North Vancouver, British Columbia, all of, Canada, assignors to Schlage Lock Company

Filed July 12, 1968, Ser. No. 744,387
Int. Cl. E05b *1/06;* **B21d** *53/38;* **F16d** *1/06*
U.S. Cl. 292—347 **8 Claims**



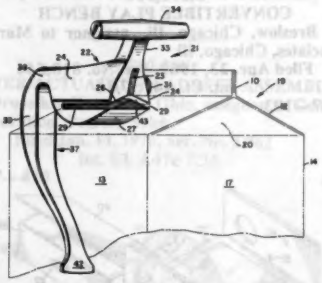
A doorknob and method of making it concern a circular shell having a rim with an edge. Material of the rim is peeled by a relatively rotating tool and is distributed around the interior periphery of the rim to form an inwardly extending tongue having an interruption. An originally separate shank has a flange disposed within the peeled rim and shouldered against the tongue, being held permanently by the inturning of the rim edge. A tab on the shank is fitted into the interruption in the shell.

3,592,500

REMOVABLE HANDLE FOR PORTABLE CONTAINERS

Paul C. Setzler, Jericho Road, Sherman, Conn.

Filed June 2, 1969, Ser. No. 829,371
Int. Cl. A47j *45/00*
U.S. Cl. 294—27 **5 Claims**



A removable and reusable handle to be secured on milk cartons and similar portable containers for convenient lifting of filled cartons and also for dispensing contents therefrom. The handle may be removed and reused with many successive cartons.

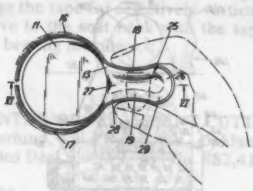
3,592,501

HOLDER FOR A DISPOSABLE BEVERAGE CONTAINER

John Bryan Stokes, 82 Coppice Road, Will Aston, Nantwich, Cheshire, and Alan Roger Griffiths, 23 Harewood Road, Marlow, Buckinghamshire, both of, England

Filed Nov. 20, 1968, Ser. No. 777,427
Claims priority, application Great Britain, Nov. 21, 1967, 52967/67
Int. Cl. A47j *45/07*
U.S. Cl. 294—32 **5 Claims**

A holder for disposable beverage containers is provided with a platform to support the base of the container and resiliently curved arms which embrace the sidewalls of the container, the curved arms being connected to a hairpin-shaped handle which is sufficiently flexible to provide aggressive engagement of the resilient curved arms on the sidewalls of the container when the hairpin limbs of the handle are gripped by a user.



3,592,502

SLING

Adolf Bolliger, Landvetter, Sweden, assignor to Goteborgs Bandvaveri AB, Goteborg, Sweden

Filed Jan. 10, 1969, Ser. No. 790,238
Claims priority, application Sweden, Jan. 10, 1968, 279/68
Int. Cl. B66c *1/12*
U.S. Cl. 294—74 **4 Claims**

A multiple-ply, flexible load-lifting sling of improved strength capable of lifting heavier loads for the same size band plies comprises two superposed woven bands or belts, preferably of synthetic material, which are interwoven together during the fabrication of the respective bands. The two separate bands are formed in concentric but oppositely formed loops without folds or any mutual tension causing creases, and are interwoven ad stitched only in intermediate areas or near the loop ends and not throughout the loop portions of the sling.

3,592,503

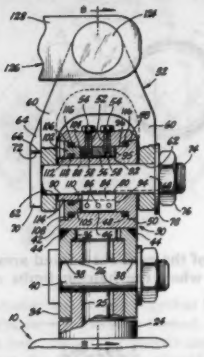
SWIVEL-MOUNTED GRAPPLE APPARATUS WITH DAMPING ACTION

John P. Lundberg, Washburn, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Apr. 9, 1969, Ser. No. 814,616
Int. Cl. B66c *1/00*
U.S. Cl. 294—86 R **7 Claims**

A grapple mechanism is suspended in a pendulous manner from the free end of a boom. To prevent free swinging, one vane member is associated with the grapple mechanism so as to move therewith. This vane, together with a stationary

vane, project into a chamber or compartment containing a liquid having a desired viscosity to provide resistance to the

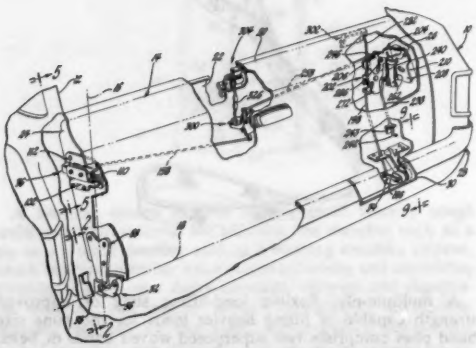


movement of the vane associated with the grapple mechanism and thereby provide the damping action.

3,592,504
DUAL-ACTION TAILGATE

Bela Sandor, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 28, 1969, Ser. No. 845,422
Int. Cl. B60j 5/10
U.S. Cl. 296—50 **3 Claims**

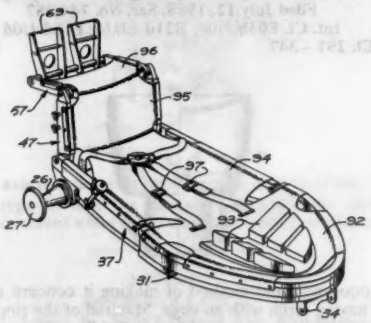


A dual-action tailgate for a conventional station wagon type vehicle is mounted on the vehicle body for swinging movement into and out of the rear opening thereof about a vertical axis as a door, or about a horizontal axis as a dropgate, by a biaxial multihinge and by a pair of hinge-latches each of which hinge-latches provides a pivotal connection about one of the two axes and is releasable to allow swinging movement of the tailgate about the other of the two axes. The operating arrangement for the tailgate includes a main latch for maintaining the tailgate in a closed position and having a pair of operating levers connected by rigid links to the hinge-latch assemblies for release of the main latch simultaneously with release of either hinge-latch. Blocking means on the operating levers function independently of the condition of the main latch to prevent simultaneous or concurrent release of both hinge-latches by sensing, through the rigid links the condition of the hinge-latches.

3,592,505
COLLAPSIBLE APOLLO COUCH

Paine, T. O., Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of; David L. Johansen, Northridge, Calif.; Walter E. Cooper, San Fernando, Calif., and Liborio J. Ferrara, La Cresenta, Calif.

Filed Feb. 4, 1969, Ser. No. 796,358
Int. Cl. A47c 1/022, 1/031
U.S. Cl. 297—68 **6 Claims**

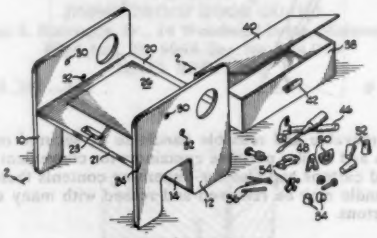


A couch system for manned space vehicles comprising a separable main frame structure and three individually foldable couches detachable therefrom, each supported by highly articulated couch frames which may be manipulated by individual occupants. The main frame and the couches may be dismantled, either completely or partially, and compacted for storage when not in use to provide more room for the occupants of the vehicle. One couch is additionally adjustable to a more upright position to facilitate operation of various controls and improve the occupant's view through a window.

3,592,506
CONVERTIBLE PLAY BENCH

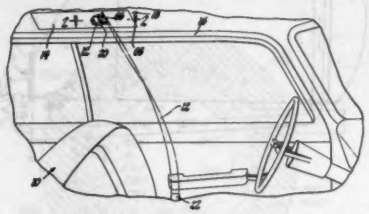
Jeffrey D. Breslow, Chicago, Ill., assignor to Marvin Glass and Associates, Chicago, Ill.

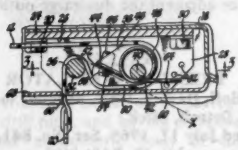
Filed Apr. 23, 1969, Ser. No. 818,544
Int. Cl. A47c 7/16
U.S. Cl. 297—193 **3 Claims**



This invention relates to children's furniture which may be used as a chair, table, activity desk or as a toy. The invention includes a pair of side panels which are connected together by a pair of fixed wall panels, and a pivotally mounted panel which may be selectively placed in any of several positions to present either of its two surfaces for use by the child or to serve as a closure for a storage compartment, a drawer or storage container is removably positionable within a storage compartment formed by the fixed wall panels and the pivotally mounted panel.

3,592,507
RESTRAINT BELT LOCK
Edmond R. Gionet, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 15, 1969, Ser. No. 850,564
Int. Cl. A62b 35/60
U.S. Cl. 297—388 5 Claims



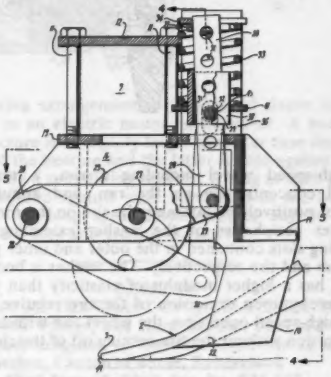


A belt lock includes a cam having a generally planar locking surface portion, a rib surface portion, and a circular surface portion. The cam is pivotally mounted between the walls of a support and biased to an unlocked position. The walls also pivotally mount therebetween a roller. A restraint belt from a spring-biased retractor passes along a base surface of the support, around the cam, around the roller, and exits the lock. The belt slides freely through the lock except when accelerated above a predetermined rate. When the belt is accelerated above the predetermined rate, the friction of the belt and the drag force of the retractor act on the cam to pivot the cam to an intermediate position where the rib surface portion slightly pinches the moving belt against the base surface to pivot the cam to the locked position where the generally planar locking surface portion is in generally parallel relationship with the base surface to frictionally hold the belt.

3,592,508
POWER ACTUATED HEADREST ASSEMBLY
Frederick Druseikis, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 14, 1970, Ser. No. 2,862
Int. Cl. A47c 7/36
U.S. Cl. 297—410 4 Claims

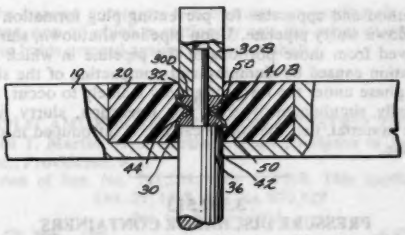
A power actuated headrest assembly for a motor vehicle includes a headrest having a downwardly extending support member that slidingly engages a guide member carried interior of a seat back. A plastic tape extends along the support member and has a lower end connected to the guide member and a free upper end that extends into the headrest. An electric motor carried by the headrest includes gear means that drivingly engage the tape for selectively vertically moving the headrest relative to the seat back with the tape serving as a columnar load bearing member.

3,592,509
CONTINUOUS PAVEMENT CUTTER
Vernon R. Soderlund, 6514 Lucas Ave., Oakland, Calif.
Filed Dec. 5, 1969, Ser. No. 882,417
Int. Cl. E01c 23/09
U.S. Cl. 299—36 18 Claims



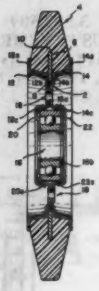
An apparatus used in conjunction with the ripper bar of a prime mover for removing a section of overlaying asphaltic pavement preparatory to digging a trench or repairing a street which consists of a cutting member having a leading edge which slices a thickness of pavement from the subgrade, a side edge in combination with a pavement engaging wheel which cuts a side of the pavement; the cutting member being curved upwardly and rearwardly to lift and break the pavement.

3,592,510
WHEEL ASSEMBLY
Vernon D. Heitfield, Leesburg, Va., assignor to Aerospace Industrial Associates, Inc., Purcellville, Va.
Filed Apr. 1, 1969, Ser. No. 812,466
Int. Cl. B60b 5/02
U.S. Cl. 301—5.7 10 Claims



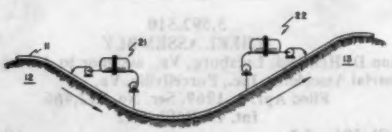
A wheel assembly having a wheel portion of a similar plastic, with integrally cast bearing races and method of casting same whereby said bearing races are secured and maintained in proper alignment within said wheel portion through exploitation of the inherent characteristics of said plastic and by means of the unique design of said races. The characteristics exploited include shrinkage of the plastic material to properly treated metal surfaces.

3,592,511
HIGH SPEED WHEEL
John C. Hudelson, Fairview Park, Ohio, assignor to American Koyo Corporation, Cleveland, Ohio
Filed May 27, 1969, Ser. No. 828,191
Int. Cl. B60c 9/00
U.S. Cl. 301—63 4 Claims



A high-speed wheel including a rim, a resilient tire mounted concentrically on the rim, and annular washer means for positively maintaining the tire on the rim, the inner and outer peripheries of the washer extending into corresponding slots contained in the outer and inner peripheries of the rim and tire respectively. The washer is bonded to the tire and has a higher modulus of elasticity than that of the tire, whereby upon expansion of the tire relative to the rim during high-speed operation, the wheel can withstand shocks and distortion without the tire coming off of the rim.

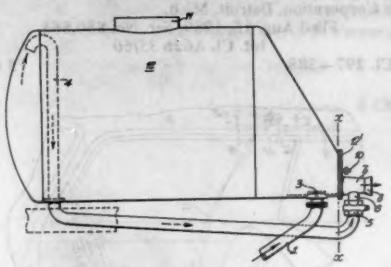
3,592,512
SLURRY STORAGE AND LIQUID INJECTION ARRANGEMENT FOR PREVENTING PLUG FORMATION IN A SHUT-DOWN SLURRY PIPELINE
Moye Wicks, III, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
Filed Sept. 23, 1969, Ser. No. 860,342
Int. Cl. B65g 53/30
U.S. Cl. 302—14 3 Claims



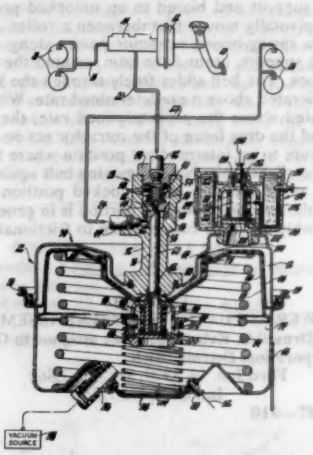
Method and apparatus for preventing plug formation in a shut-down slurry pipeline. Upon pipeline shutdown, slurry is removed from those portions of the pipeline in which plug formation caused by slumping and compacting of the slurry solid phase under the force of gravity is likely to occur. Substantially simultaneously with this operation, slurry liquid phase material, i.e., the slurry carrier, is introduced into the pipeline.

3,592,513
PRESSURE DISCHARGE CONTAINERS
Ralph Murfitt, Wisbech, England, assignor to R. Murfitt Limited, Wisbech, England
Filed Aug. 19, 1968, Ser. No. 753,600
Claims priority, application Great Britain, Aug. 31, 1967, 39,907/67
Int. Cl. B65g 53/40
U.S. Cl. 302—53 8 Claims

Means for use in discharging powder materials from containers, particularly bulk transport vehicles in which a pressure-operated valve is provided in the base of the vehicle for admitting air or other gas to the container so that the material is aerated at or adjacent the discharge outlet.



3,592,514
PRESSURE MODULATOR
Edward J. De Hoff, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed July 11, 1969, Ser. No. 841,001
Int. Cl. B60t 8/02
U.S. Cl. 303—21 F 5 Claims



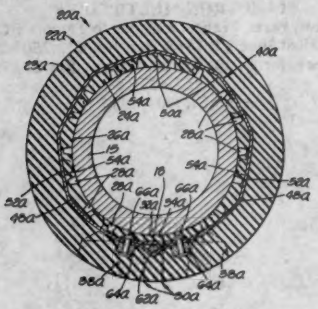
A brake pressure modulator in which the pressure controlling signals are received electrically by a release valve and a hold valve. The hold valve is mounted on the modulator power wall and is normally open to admit vacuum from the modulator vacuum chamber to the modulator variable pressure chamber. The release valve is mounted on the variable pressure chamber housing section and is normally closed. In the normal condition, the modulator provides for a direct connection between the master cylinder of a brake system and the wheel brakes to be controlled by the modulator. In the release stage of operation, the release valve is opened and the hold valve is closed. The modulator power wall moves to disconnect the brake master cylinder and the wheel brakes being controlled, and upon sufficient modulator power wall movement, the pressure is decreased at the wheel brakes by increasing the brake fluid volume. The modulator provides for a hold stage in which both valves are closed, thereby positioning the power wall to maintain a brake pressure at the wheel brakes. The modulator will return to the brake apply stage when the signals to the valves return them to their normal positions. The modulator is used in an antilock brake system.

3,592,515

PIPE COLLAR WITH POLYGONAL-TYPE INSERT

John C. Grant, Huntington Park, Calif., assignor to Byron Jackson Inc., Long Beach, Calif.

Filed Sept. 23, 1969, Ser. No. 860,288
Int. Cl. F16c 17/00
U.S. Cl. 308—4 A 11 Claims



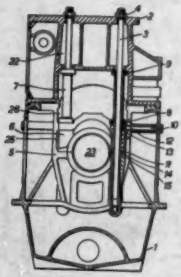
A generally cylindrical collar or protector adapted to be clamped onto a drill pipe, and having adhesively bonded and embedded in the elastomeric body of the protector a generally cylindrical spring insert band with substantially polygonal wall portions which are pliant, so that when the protector is constricted and secured onto the pipe, flexing of the pliable wall portions and displacement of the elastomeric material between the band and the pipe allow the collar to adapt or conform to the pipe of varying diameters.

3,592,516

RETAINING DEVICE FOR CRANKSHAFT BEARINGS OF INTERNAL COMBUSTION ENGINES

Hans Standhardt, Magdeburg, Germany, assignor to Veb Schwermaschinenbau "Karl Liebknecht" Magdebrug, Magdeburg, Germany

Filed Apr. 7, 1969, Ser. No. 813,889
Int. Cl. F16c 3/06
U.S. Cl. 308—23 7 Claims



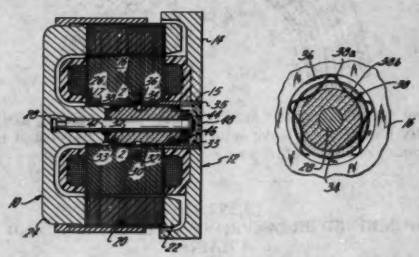
A shaft-bearing structure, mainly for the crankshaft of an internal combustion engine, where the engine has a cylinder block and a base plate. The bearing structure comprises an upwardly facing bearing block, integral with the base plate, and a downwardly facing bearing cover, downwardly spaced from an end of the cylinder block by an intermediate space. Tension-resistant connecting rods extend through the cylinder block, the intermediate space, and the bearing cover, into the bearing block to aid in uniting the cylinder block with the base plate. Compression-resistant sleeves coaxially surround the connecting rods, in the intermediate space, to releasably press the bearing cover against the bearing block, at points close to the axis, as defined by said rods, while allowing the bearing cover and sleeves to be upwardly removed from the bearing blocks, through the intermediate space, to facilitate inspection and repair of the shaft-bearing structure.

3,592,517

BEARING MOUNTING ARRANGEMENT

Dwight E. Harris, Woodstock, N.Y., assignor to Rotron Incorporated, Woodstock, N.Y.

Filed Apr. 8, 1969, Ser. No. 814,253
Int. Cl. F16c 27/00
U.S. Cl. 308—26 5 Claims



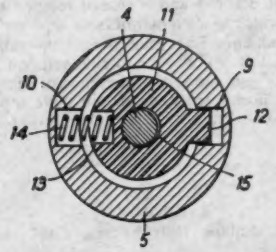
A mounting arrangement for a sintered sleeve bearing is described, in an electric motor environment. A bore in the motor structure is of slightly larger diameter than the outside diameter of the bearing and the latter is held against rotation in the bore by a snug-fitting resilient O-ring at each end. The sleeve is secured against axial movement in the bore by a corrugated retaining spring that engages aligned annular grooves in the bore and around the sleeve.

3,592,518

BEARING FOR THE SHAFT OF AN ELECTRIC MOTOR

Pierre-Frederic Pfister, and Kurt Rubner, both of Sonceboz, Switzerland, assignors to Societe Industrielle de Sonceboz S.A., Sonceboz, Canton of Berne, Switzerland

Filed June 18, 1969, Ser. No. 834,332
Claims priority, application Switzerland, June 27, 1968, 9568/68
Int. Cl. F16c 27/00
U.S. Cl. 308—26 5 Claims



The bearing comprises two bearings, or bearing elements, proper, one of which is stationary and the other of which a spring holds pressed against the motor shaft.

3,592,519

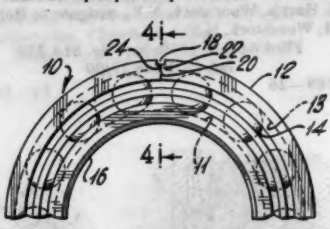
SPLIT ANTIFRICTION-BEARING CONSTRUCTION

Steven T. Martin, West Hartford, Conn., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 741,731, July 1, 1968. This application Oct. 29, 1969, Ser. No. 870,929
Int. Cl. F16c 13/02
U.S. Cl. 308—196 6 Claims

A method for fabricating a bearing structure of the split-ring type is described. The bearing outer race ring, after formation and hardening, is split to define a seam, and the fractured ends are separated to preassemble the bearing with antifriction elements and an inner race ring. The fractured ends are then joined by fusion-welding at the seam with an electron beam. In one method, the beam is directed axially at a radially outer portion of the seam, and in another method the

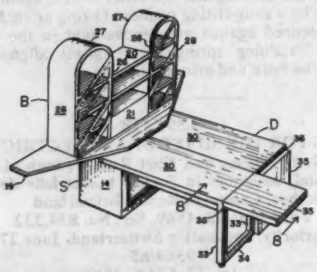
beam is directed radially inwardly at the periphery, to effectively fuse the outer peripheral portions of the fractured ends



to one another. In both methods, the fusion-welding is sufficiently localized to leave intact the original finish and heat treatment of the fractured ring.

3,592,520
COMBINED BREAKFRONT, DINING TABLE AND CHAIRS

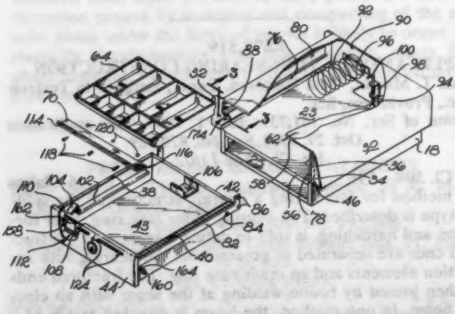
Rocco E. Marino, 4747 Collins Ave., Miami Beach, Fla.
Filed June 23, 1969, Ser. No. 835,426
Int. Cl. A47b *85/00, 83/00, 39/00*
U.S. Cl. 312—241 1 Claim



A combined breakfront and dining table and chairs consisting of a rectangular cabinetlike support section, a breakfront section and a table-and-chair section. The breakfront section is mounted above and is spaced relation to the support section in which space a pair of table tops are positioned in end-to-end relation. Pivot pins permit the table tops to swing approximately 90° to side-by-side relation to form a dining table with legs supporting the ends of the tables and chairs normally positioned beneath the table tops on each side of the support section when the table tops are in end-to-end relation.

3,592,521
LOCKBOX

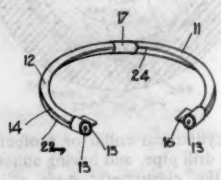
Donald E. Cox, Rolling Hills Estates, Calif., assignor to Coxwells, Inc.
Filed Feb. 2, 1970, Ser. No. 7,547
Int. Cl. A47b *88/20*
U.S. Cl. 312—333 14 Claims



A drawer-type lockbox for service stations and the like in which key-operated reciprocating locking bars engage spring-loaded keepers. A cover plate is secured to the front wall of the drawer over the locking bar mechanism and one or more slits are defined through the front wall over the cover and in line of sight with the space between the bottom wall of the drawer and a cash tray in the drawer.

3,592,522
METHOD OF MANUFACTURING TUBES FOR TUBULAR ELECTRON-MULTIPLIERS

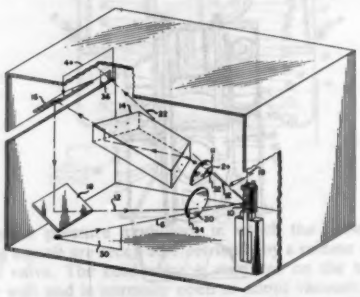
Henri Rougeot, Paris, France, assignor to Thomson-CSF
Filed June 12, 1969, Ser. No. 832,750
Claims priority, application France, July 2, 1968, 157,477
Int. Cl. H01j *9/38*
U.S. Cl. 316—3 3 Claims



The tube is cut along two of its generatrices 14 and 24, over the whole of its length, and the two halves 12 and 22 thus obtained receive a secondary electron emissive coating on their inner walls. The two halves are then replaced in their initial position relatively to one another.

3,592,523
ANGLE MULTIPLIER APPARATUS

Paul Shang Yu Wu, Kettering, Ohio, assignor to The National Cash Register Company, Dayton, Ohio
Filed May 19, 1969, Ser. No. 825,702
Int. Cl. G02b *17/00*
U.S. Cl. 350—6 2 Claims



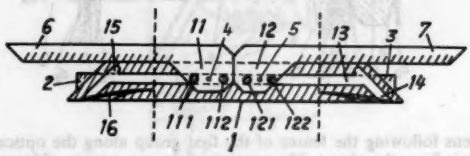
The present invention relates to an angle multiplier apparatus, which increases the angle at which an incident beam, in an incident plane, is deflected by a beam-deflecting means with respect to said incident plane. An incident beam is deflected by the deflecting means at a first selected angle with respect to the incident plane. The deflected beam is redirected back onto the deflecting means from a side of the incident plane opposite from the deflected beam, and redeflected. The redeflected beam is deflected at a greater deflection angle with respect to the incident plane than the deflected beam, due to a shift of the deflected beam across the incident plane prior to its redeflection. By use of the angle multiplier apparatus of the present invention in a beam-scanning apparatus, the overall angle through which a beam may be scanned is increased.

3,592,524

COLLAPSIBLE REFLECTING STEREOSCOPE

Roland Schlienger, Heerbrugg, Switzerland, assignor to Wild Heerbrugg Aktiengesellschaft, Heerbrugg, Switzerland

Filed Feb. 2, 1970, Ser. No. 7,750
Claims priority, application Switzerland, Oct. 14, 1969, 15389/69
Int. Cl. G02b 27/24, 27/22
U.S. Cl. 350—137 4 Claims



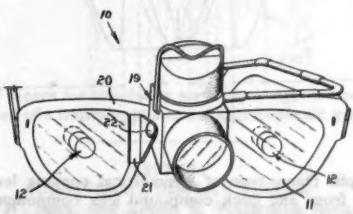
A collapsible reflecting stereoscope comprising a lens holder and two magnifying lenses carried by said lens holder. The lens holder has two lengthwise surfaces provided with groove means. A pair of outer deflecting mirrors having shaft means are mounted displaceably and pivotally in said groove means, and there are also a pair of inner deflecting mirrors having frame means and equipped with shaft means for pivoting said two inner deflecting mirrors transverse to said lengthwise surfaces of said lens holder. The lens holder has a recess with two inclined surfaces for receiving the upper ends of the frames of the pivoted-out inner deflecting mirrors.

3,592,525

ILLUMINATING HEADPIECE FOR SPECTACLES INCLUDING SECONDARY MAGNIFYING LENSES

Donald Herbert Schultz, Black Forest, South Australia, Australia, assignor to Sola International Pty. Ltd., Black Forest, South Australia, Australia

Filed May 13, 1969, Ser. No. 824,159
Claims priority, application Austria, May 16, 1968, 37953/68
Int. Cl. G02b 25/02; A61b 3/12
U.S. Cl. 350—146 4 Claims



An illuminating headpiece suitable for use by dentists wherein a pair of secondary lenses extend through apertures in respective spectacle glasses in a frame so as to be closer to the pupil of the user than the spectacle glass. The spectacle frame carries on it a lamp housing for illuminating the object to be viewed through the secondary lenses. The secondary lenses may each be constituted by a single lens having an inner lens surface of toroidal or spherical shape and an outer lens surface of aspherical shape.

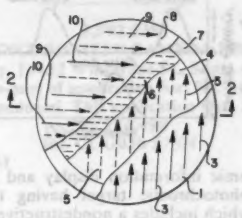
3,592,526

MEANS FOR ROTATING THE POLARIZATION PLANE OF LIGHT AND FOR CONVERTING POLARIZED LIGHT TO NONPOLARIZED LIGHT

John F. Dreyer, c/o Polacoat Incorporated 9750 Conklin Road, Cincinnati, Ohio

Filed July 15, 1969, Ser. No. 841,857
Int. Cl. G02b 5/30
U.S. Cl. 350—159 9 Claims

A light transmissive device which will rotate the plane of polarized light and will also depolarize plane polarized light passed through the device, said device comprising a pair of directionally oriented supporting surfaces, such as unidirectionally rubbed glass or plastic plates, rotatable relative to each other and separated by a thin film of a nonoptically active nematic liquid crystal material, the device acting to rotate the plane of the polarized light when the directionally oriented surface first contacted by the entering light is either parallel or perpendicular to the plane of polarization of the entering light and the remaining directionally oriented surface is rotated so as to bring its oriented surface to the desired plane of polarization for the exiting light, the device also acting to convert plane polarized light to nonpolarized light when the oriented surface first contacted by the entering light lies at an angle of 45° with respect to the plane of polarization of the entering light and the directionally oriented surfaces are parallel to each other.

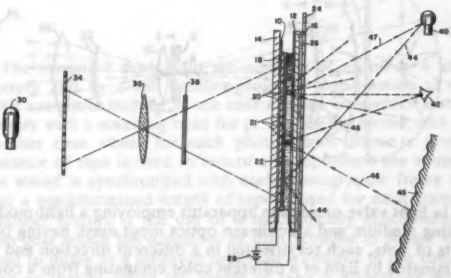


3,592,527

IMAGE DISPLAY DEVICE

Gary H. Conners, and Paul B. Mauer, both of 901 Elmgrove Road, Rochester, N.Y.

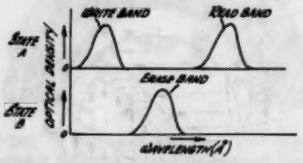
Filed Nov. 12, 1969, Ser. No. 875,751
Int. Cl. G02f 1/28
U.S. Cl. 350—160 14 Claims



A display device utilizes a liquid crystal in a layered structure as a display screen. This structure includes in order a first transparent electrode, a photoconductive layer, a specular conductive mosaic layer, a liquid crystal layer and a second transparent electrode. The electrodes are connected to a DC source to provide an electric field therebetween. A radiation pattern to be displayed, is projected onto the photoconductive material through the first electrode rendering the photoconductive material conductive in exposed areas to cause a change in the degree of transparency of the liquid crystal film to form an image corresponding to the radiation pattern. This image can be viewed through the first electrode by ambient or artificial light reflected from the specular mosaic layer. To avoid undesirable reflections, a black background or a circular polarizer may be used.

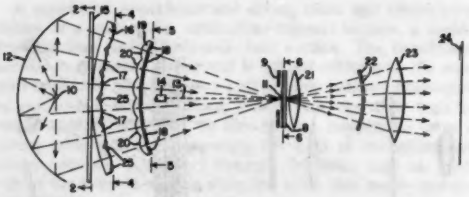
If a nematic liquid crystal is used, the display is erased when the electric field is removed, whereas if a mixture of nematic and cholesteric materials is used, the image remains on the liquid crystal for a period of time after removal of the electric field.

3,592,528
PHOTOCHROMIC DISPLAY DEVICE
Zoltan J. Kiss, Belle Mead, N.J., assignor to RCA Corporation
Filed Mar. 26, 1968, Ser. No. 716,032
Int. Cl. G03c 1/00
U.S. Cl. 350—160 4 Claims



A photochromic information display and storage device comprises a photochromic target having two absorption states, one of which includes a nondestructive readout band. The target comprises, for example, cerium or lanthanum-doped calcium fluoride crystals. The device also includes means for switching the target from one absorption state to the other and means for directing light in the nondestructive readout band onto the target for the purpose of reading the information stored thereon. The device may also include means for detecting that portion of the light in the nondestructive readout band which is not absorbed by the target and/or means for switching the absorption state of the target back to its original state.

3,592,529
LENTICULAR LENS ARRAY FOR OPTICAL PROJECTION SYSTEM
Lawrence A. Juhlin, Jr., Greenville, Ill., and Michael Graser, Jr., Bedford, Mass., assignors to General Electric
Filed Mar. 4, 1970, Ser. No. 16,421
Int. Cl. G02b 27/38
U.S. Cl. 350—162 R 8 Claims



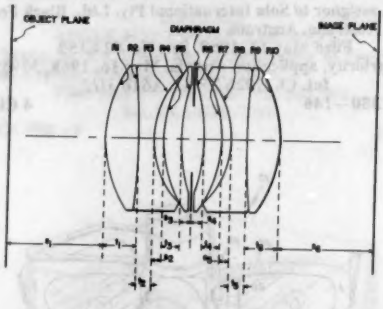
In light valve projection apparatus employing a light-modulating medium and a Schlieren optics input mask having two sets of slots, each set oriented in a different direction and illuminated by light of a different color emanating from a common source so as to produce light of both colors on the medium, center-to-center spacing of the slots in one set is made independent of center-to-center spacing of the slots in the other set. Lenticular lens of two different aspect ratios image the source in either color, respectively, onto the slots of either set, respectively, through an additional mask.

3,592,530
ANASTIGMATIC MEDIUM-POWER MICROSCOPE OBJECTIVE PROVIDING A FLATTENED IMAGE FIELD
Walter Klein, Wissmar, Kreis Wetzlar, Germany, assignor to Ernst Leitz G.m.b.H., Wetzlar, Germany
Filed June 25, 1964, Ser. No. 377,912
Claims priority, application Germany, July 9, 1963, L 45292 IXa/42h
Int. Cl. G02b 9/34, 9/60, 21/02
U.S. Cl. 350—216 5 Claims

The invention provides an anastigmatic medium-power microscope objective which provides a flattened image field and which consists of a small number of lenses divided into two groups for correcting substantially all image errors. The first group of lenses comprises a thick meniscus lens having positive refractive effect next to the object, and one or two converging lens members arranged close to each other, at least one of the latter being a doublet having a convex cemented surface facing the object. The second group of lenses consists of a simple converging lens and a simple diverging

lens following the lenses of the first group along the optical axis from the object. The spacing of the two groups of lenses is appropriately designed for the desired purpose of providing an anastigmatic flattened image with these groups of lenses and is at least half the axial distance between the object and the apex.

3,592,531
SPLIT DAGOR-TYPE OF SYMMETRICAL COPYING LENS SYSTEM
George L. McCrobie, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Continuation-in-part of application Ser. No. 856,730, Sept. 10, 1969, now abandoned. This application Mar. 26, 1970, Ser. No. 23,048
Int. Cl. G02b 9/34
U.S. Cl. 350—220 7 Claims

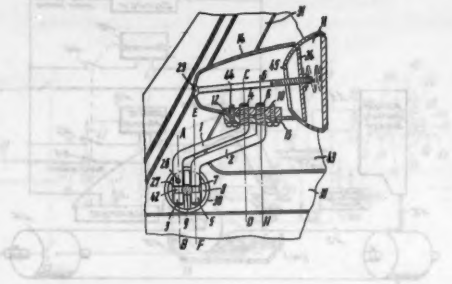


A Split Dagor-type of symmetrical copying lens system having front and back compound lens components with a centrally located diaphragm therebetween adapted to an optical system of a copier which can be used at both 1:1 and 1:1.6 magnifications, and all magnifications therebetween. The front lens component has three lens elements including, in the following order, a first lens element of positive power, a second lens element of negative power cemented to the first lens element and a third lens element of positive power disposed between the second lens element and diaphragm, and the back lens component having three similar lens elements positioned so that the lens system is symmetrical.

3,592,532
REAR VIEW MIRROR FOR VEHICLES
Yorck Talbot, Ebersstrasse 80, Berlin 62, Germany
Filed Dec. 13, 1968, Ser. No. 783,777
Claims priority, application Germany, Dec. 15, 1967, P 16 55 466.8
Int. Cl. G02b 5/08
U.S. Cl. 350—307 9 Claims

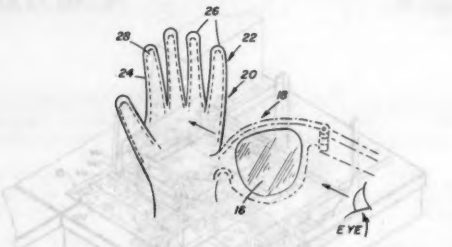
A rear view mirror for mounting on the coachwork of a vehicle having a longitudinal axis. A base member is adapted to be mounted on the vehicle coachwork. An elongated mirror-head assembly is provided and has an axis. Mounting

means mounts the mirror-head assembly on the base member for pivoting movement with reference to the latter in direction transversely of the longitudinal axis of the vehicle be-



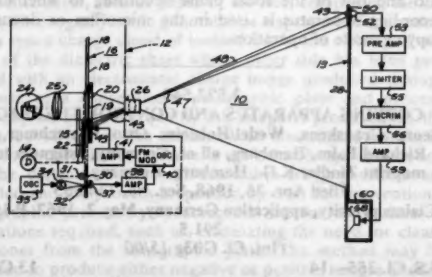
tween a plurality of positions in each of which the axis of the mirror-head assembly is in parallelism with the longitudinal axis of the vehicle on whose coachwork the rear view mirror is mounted.

3,592,533
OPTICAL DEVICE FOR SIMULATING OPTICAL IMAGES
Harold N. Braunhut, c/o Honey Toy Industries Inc. 200 Fifth Ave., New York, N.Y.
Filed June 25, 1969, Ser. No. 836,412
Int. Cl. A63h *33/22*
U.S. Cl. 350—321 **10 Claims**



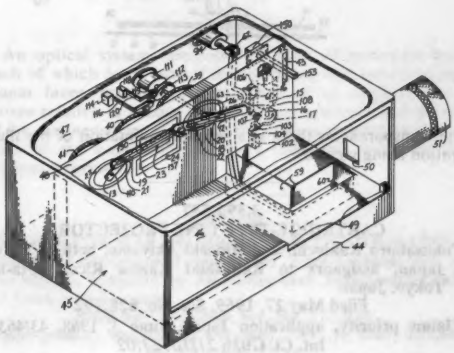
Optical means for simulating an X-ray image comprising a lens formed of a transparent stressed thermoplastic material.

3,592,534
AUDIOVISUAL DISPLAY SYSTEM
Sherman W. Duck, and Robert K. Willardson, both of Arcadia, Calif., assignors to Bell & Howell Company, Chicago, Ill.
Filed Apr. 7, 1969, Ser. No. 814,098
Int. Cl. G03b *31/02, 31/04*
U.S. Cl. 352—28 **25 Claims**



An audiovisual display system in which a projection lens projects recorded images from an image plane as well as optical radiations modulated by sound accompaniments for the images. The sound accompaniments are picked up at a location displaced from the image plane or are picked up by external playback equipment and are presented at a location within optical reach of the projection lens for simultaneous projection by the same projection lens. The optical radiations are preferably invisible and time modulated by the sound accompaniments.

3,592,535
SOUND-SYNCHRONIZED CAMERA-PROJECTOR
Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif.
Continuation-in-part of application Ser. No. 644,022, June 6, 1967, now abandoned. This application Oct. 24, 1968, Ser. No. 784,498
Int. Cl. G03b *31/04*
U.S. Cl. 352—31 **14 Claims**

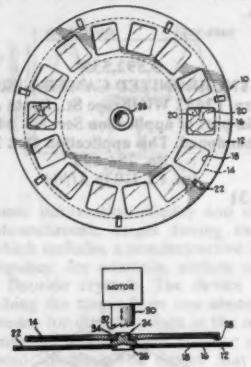


The invention deals with the addition of sound to a still camera and to a still camera-projector combination. Two basic variations include in one case a sound tape which is stationary with a scanning head for producing the sound, and in another case where for each photographic frame a given distance of tape is used to record and reproduce the sound; the sound is synchronized with each photographic frame so that a predetermined length of tape is used for each frame. Another feature is the use of a mechanically synchronized cam gear which has a number of high portions to permit the head to move to a different height with respect to the sound tape so that in effect the length of tape is effectively multiplied by the number of high portions on the cam gear. This allows a large quantity of photographic slides with sound to be stored in a small cartridge which is part of the invention. The cartridge is in two parts which disconnect from each other for developing the film part of the cartridge.

3,592,536
STEREOSCOPIC TRANSPARENCY UNIT WITH ANIMATION
Gunars Licitis, Lombard, and Marvin I. Glass, Chicago, both of, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Dec. 11, 1969, Ser. No. 884,064
Int. Cl. G03b *35/26*
U.S. Cl. 352—57 **7 Claims**

A stereoscopic transparency holder unit which provides for animation of the illustrations on photographic transparencies. The unit includes a circular disc mounting a plurality of pairs of photographic transparencies adjacent the outer circumferential portion of the disc, and a rotatable circular member is disposed in coaxial arrangement with the disc and includes polarizing material overlying the path of the transparency.

The transparencies include polarizing segments or portions, and as the circular member is rotated during the viewing of



the transparencies there is a resulting animation of the illustration being viewed.

3,592,537

CARTRIDGE-TYPE CINE-PROJECTOR

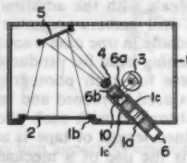
Tokusaburo Kakiuchi, and Hideaki Akiyama, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Ota-ku, Tokyo, Japan

Filed May 27, 1969, Ser. No. 828,192

Claims priority, application Japan, June 3, 1968, 43/46369

Int. Cl. G03b *21/10, 23/02*

U.S. Cl. 352—72 **3 Claims**



A cartridge-type cine-projector having on its front panel a screen and a separate opening having wall means that slant inwardly toward the screen at an angle of about 50°. A film cartridge having an included light source reflecting mirror is insertable into said opening and an image from the film is projected onto an angled mirror mounted rearwardly from the screen so that the image reflected from the angled mirror appears on the screen.

3,592,538

PHOTOGRAPHIC COPYING APPARATUS

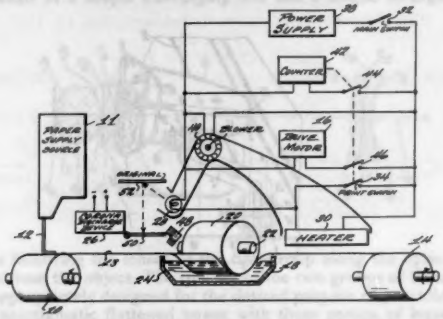
Takeshi Ukai, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of application Ser. No. 644,140, June 7, 1967, now abandoned. This application Dec. 17, 1969, Ser. No. 885,726

Int. Cl. G03g *15/00*

U.S. Cl. 355—3 **4 Claims**

Photographic copying apparatus having a heater employed in conjunction with a lamp for drying the recording element or copying paper and wherein the heater is in circuit with the lamp to permit the preliminary heating of the lamp prior to



full lighting thereof so as to reduce the inrush of current to the lamp when full voltage is applied thereto.

3,592,539

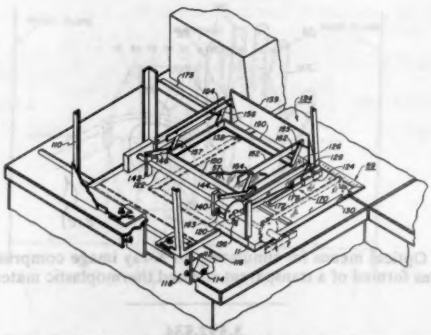
RECORDING APPARATUS

Peter Haslam, Fairport; Alan G. Kendall, Rochester, and Douglas W. Shaffer, Penfield, all of, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Feb. 3, 1969, Ser. No. 795,814

Int. Cl. G03g *15/04*

U.S. Cl. 355—11 **4 Claims**



Recording apparatus which reproduces enlarged copies of microfilm and/or document material by controlling the position of a reader screen and a lens-positioning assembly in relation to a copier platen. The lens-positioning assembly includes a fixed frame and a movable frame supported from the fixed frame for swinging a lens member toward and away from the focal plane of the apparatus. Control apparatus including sensing devices are used to position the lens member into and out of the focal plane according to whether the recording apparatus is used in the microfilm or document copying mode of operation.

3,592,540

COPYING APPARATUS AND CONTROL THEREFOR

Georg Cranskens, Wedel/Holstein; Otto Kretzchmar, and Richard Palm, Hamburg, all of, Germany, assignors to Lumoprint Zindler K.G., Hamburg, Germany

Filed Apr. 26, 1968, Ser. No. 724,553

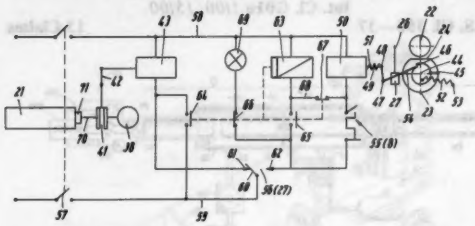
Claims priority, application Germany, May 2, 1967, P 15 72 291.5

Int. Cl. G03g *15/00*

U.S. Cl. 355—14 **13 Claims**

An improved copying apparatus has control means for transporting sheets of copying material from a stack and has

an exposure device along which an original can be guided. By actuation of a switch, when an original is inserted, a copy paper is moved, by rollers associated with the stack of copy paper, from a ready position in order to transport the copy paper, synchronously with the original, through the exposure device and through processing devices upstream and



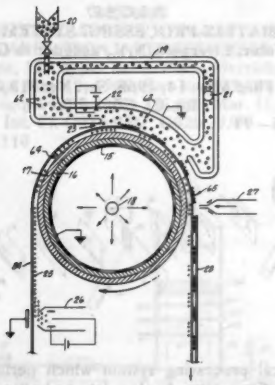
downstream of the exposure device. The ready position of the copy paper is determined by a switch in the path of the copy paper, and this switch is actuated by the arrival of the copy paper and stops the withdrawal means. The switch is released after the passage of the copy paper so that one copy paper follows another in succession into the ready position.

3,592,541

COPYING SYSTEM USING ELECTROGASDYNAMICS

Meredith C. Gourdine, West Orange, N.J., assignor to Gourdine Systems, Inc., Essex, N.J.

Filed Sept. 30, 1968, Ser. No. 763,722
Int. Cl. G03g *5/02*
U.S. Cl. 355—17 **10 Claims**



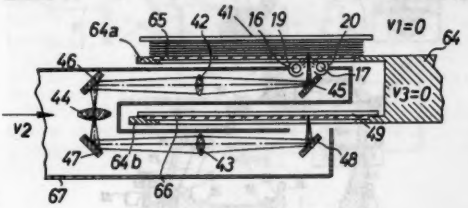
An apparatus and method for reproducing an image on a dielectric sheet, such as paper or the like, comprising the use of an electrogasdynamic generator as a spray gun for producing a space charge cloud of ionized ink in the vicinity of one side of the dielectric sheet whose other side has been provided with an electrostatic charge image produced through the use of a conventional xerographic plate and process, whereby an improved quality ink image is produced on the sheet by virtue of the tendency of electrogasdynamically produced particles to achieve a uniform charge distribution on the dielectric surface. Undesirable fringing effects are avoided and the process is speeded up over the conventional xerographic process by reducing the number of mechanical operations required, such as, eliminating the need for cleaning toner from the xerographic plate. The method may be adapted to produce either negative or positive images and for use with high-speed printing systems.

3,592,542

COPYING APPARATUS WITH LENTICULAR OPTICAL SYSTEM

Helmut Kaufer, Metzkausen, Upper Bavaria, Mettmann; Erich Burger, Unterhaching, Munich, and Hans-Peter Huber, Munich, all of, Germany, assignors to AGFA-Gevaert AG, Munich, Germany

Continuation of application Ser. No. 508,258, Nov. 17, 1965, now abandoned. This application June 11, 1968, Ser. No. 739,897
Claims priority application Germany, Nov. 20, 1964, A47,647
Int. Cl. G03b *27/50*
U.S. Cl. 355—50 **27 Claims**



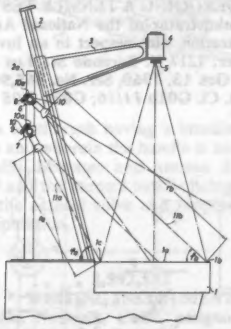
An optical system composed of pairs of lenticular bars, each of which has a row of lens portions with spherical and planar faces, scans successive strips of an original which moves relative to a copy sheet. Strip-shaped erected images of the scanned strips are projected onto successive strip portions of the copy sheet where a complete image of the original is formed.

3,592,543

DEVICE FOR MAKING MICROFILM PHOTOGRAPHS

Horst Bickl, Munich, and Josef Pfeifer, Unterhaching, both of, Germany, assignors to AGFA-Geraert Aktiengesellschaft, Leverkusen, Germany

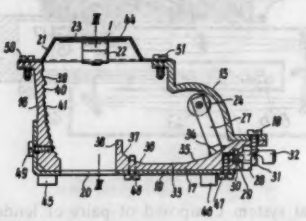
Filed Nov. 19, 1968, Ser. No. 777,034
Claims priority, application Germany, Nov. 30, 1967, A57,545
Int. Cl. G03b *27/56*
U.S. Cl. 355—67 **4 Claims**



A device for making microfilm photographs, and in particular an illuminating assembly for the device. The device includes a support which has a supporting surface on which the item to be photographed is located. A camera stand situates a camera over this surface, and the illuminating assembly is located in its entirety to one side of this surface, so that where the surface is rectangular, for example, it is freely accessible at its other three sides. The illuminating assembly is composed of two rows of lamp means for respectively providing light beams the intensity of which is controlled to a great degree by the angle of emission of the light beams. An adjusting means coacts with the rows of lamp means for directing the axes of the beams issuing from one row of the lamp means to that edge of the photographed item which is nearest to the one row, while the other row of lamp means is

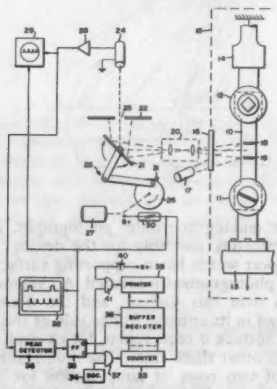
adjusted so that the axes of the beams issuing therefrom extend along the opposed edge of the item. In addition, the adjusting means is capable of adjusting the distance between the rows of lamp means and the supporting surface.

3,592,544
EXPOSURE DEVICE
Karl Brendel, Rellingen, Holstein, Germany, assignor to Lumoprint Zindler KG, Hamburg, Germany
Filed Apr. 25, 1968, Ser. No. 724,117
Claims priority, application Germany, Apr. 28, 1967, 56 381
Int. Cl. G03b *27/54*
U.S. Cl. 355—70 11 Claims



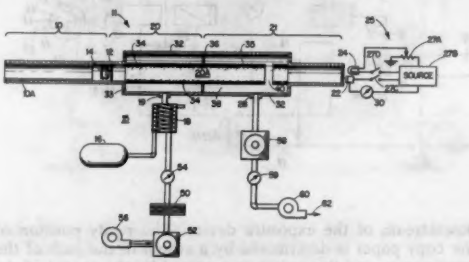
An exposure device for copying apparatus, with a light source and a reflector assembly, which reflector assembly is divided into a plurality of reflector surfaces which are of elongated shape and are provided with their longitudinal axes parallel to one another in a channellike arrangement, wherein the light source is displaced relative to the projection of an exposure opening and a reflector, with at least a part at the side of the device where the exposure opening is arranged about the light source, so that the light source is screened by this reflector surface from the exposure opening and wherein the reflector surfaces are so arranged that a part of the light beam is directed by means of two reflector surfaces to the exposure opening.

3,592,545
APPARATUS FOR REMOTE MEASUREMENT OF DISPLACEMENT OF MARKS ON A SPECIMEN UNDERGOING A TENSILE TEST
T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Robert H. Silver, 1217 N. Berendo St., Los Angeles, Calif.
Filed Oct. 13, 1969, Ser. No. 865,909
Int. Cl. G01b *11/16*; G01n *3/08*
U.S. Cl. 356—32 3 Claims



Apparatus is disclosed for measuring displacement of marks on a specimen undergoing a tensile test comprising means for illuminating the field of marks, means for scanning the illuminated field with an oscillating mirror, or the like, a photosensitive detector, and means for recording in analog or digital form the time between detecting marks as the specimen undergoing testing is continuously scanned.

3,592,546
CONDENSATION NUCLEI DETECTOR
Robert A. Gussman, 12 Greenwood Road, Canton, Mass.
Filed Nov. 21, 1969, Ser. No. 878,801
Int. Cl. G01n *1/00*, *15/00*
U.S. Cl. 356—37 13 Claims



A condensation nuclei particle detector is provided that is capable of continuous operation. An air sample possible containing nuclei is humidified and then passed to a contact chamber in which a water droplet is formed about each nuclei by introducing supercooled nuclei-free air into the chamber. The contact chamber has associated with it, (1) a porous, annular, outer chamber through which the supercooled air is radially introduced to the contact chamber to cause the supersaturation of the humid air, (2) optical or other means for indicating the nuclei concentration of the air sample, and (3) an exhaust port through which the sample exits.

3,592,547
OPTICAL MATRIX-PROCESSING SYSTEM AND OPTICS
Milton L. Noble, Liverpool, N.Y., assignor to General Electric Company
Filed Mar. 14, 1968, Ser. No. 713,218
Int. Cl. G06k *9/08*
U.S. Cl. 356—71 4 Claims

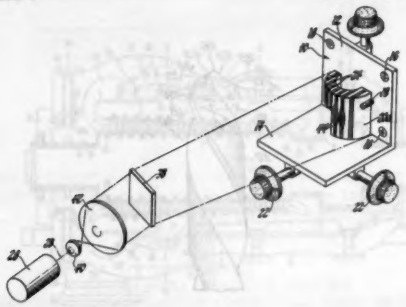
An optical processing system which performs a general matrix transformation. Analog data to be transformed is entered as a first set of inputs written upon a first writing medium in the form of diffraction-grating lines in a column arrangement of a plurality of resolution elements. The matrix transform function is entered as a second set of inputs written as diffraction-grating lines on a second writing medium in a column, row arrangement of resolution elements. With respect to said first and second sets of inputs, magnitude information is contained in the transmissivity of the resolution elements, and phase information may be contained in the spatial frequency of the grating lines. A matrix processing of said first set of inputs by said second set of inputs is optically performed by imaging spatially filtered light from individual resolution elements of the first medium upon corresponding rows of resolution elements of the second medium by means of a first anamorphic telecentric lens arrangement, and by imaging spatially filtered light from the resolution elements of the second medium as a single row of resolution elements in an output image plane by means of a second anamorphic telecentric lens arrangement.

3,592,548

HOLOGRAPHIC METHOD OF DIMENSIONAL INSPECTION

Richard F. Majowski, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 22, 1969, Ser. No. 792,916
Int. Cl. G06k 9/08; G01b 9/02, 11/00
U.S. Cl. 356—71 10 Claims



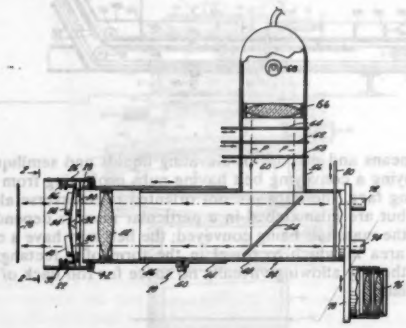
To dimensionally compare one contour surface with another, one surface is provided with a contrast pattern and a hologram is made of that surface. Then the hologram is reconstructed and the image of the contrast pattern is superposed on the other surface. The contrast pattern will register with the other surface only to the extent that the two surfaces are alike. Where the surfaces are not alike, the amount of the difference is determined by moving the second surface through a measured distance until the pattern is registered with the surface.

3,592,549

INTENSITY-MEASURING APPARATUS USING POLARIZATION INTERFEROMETRY

Robert Hoffman, 12 Copper Beech Place, Merrick, N.Y.

Filed May 19, 1969, Ser. No. 825,704
Continuation-in-part of Ser. No. 712,011, Mar. 11, 1968
Int. Cl. G01b 9/02; G02b 21/06
U.S. Cl. 356—110 5 Claims



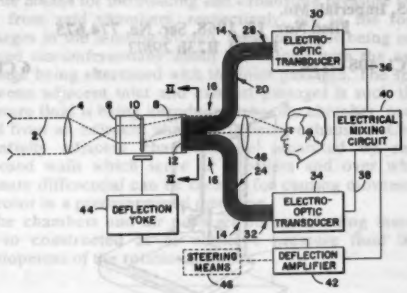
An optical system for precision angular measurement using polarization interferometry comprising a light source, a specimen, and a focusing system for directing light rays. Adjustable spaced birefringent elements are provided for splitting and displacing light rays from the focusing system and for receiving light rays from the specimen. An analyzer is provided for causing light rays from each of the spaced birefringent elements to interfere, and detectors and provided for measuring the relative light intensity of each of the interfering light rays.

3,592,550

OPTICAL TRACKING SYSTEM

Calvin J. Christmann, Mount Clemens, Mich., assignor to LTV Aerospace Corporation, Dallas, Tex.

Filed June 26, 1968, Ser. No. 740,214
Int. Cl. G01b 11/26
U.S. Cl. 356—152 4 Claims



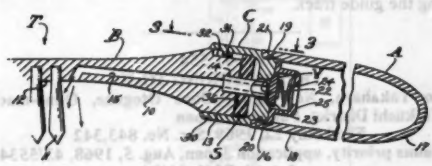
A target acquisition and tracking system including an image converter tube with optical means for receiving light from a target area and creating an image on the tube's photocathode, a plurality of light-transmitting fibers arranged to receive light from the tube's phosphor screen and means to sense the light level from these fibers to in turn control tube deflection.

3,592,551

AEROSOL CHARGED TOOTHBRUSH

Carl O. Muglia, 1028 Pearl Street, Apt. C, Santa Monica, Calif.

Filed July 24, 1969, Ser. No. 844,441
Int. Cl. A46b 11/02
U.S. Cl. 401—190 9 Claims



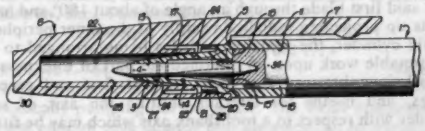
Especially a toothbrush having a brushing head separable from a handle and wherein the handle is an aerosol container that controllably liberates and aerates dentrifice into the brushing head and the aerosol handle being shiftably coupled for actuating the aerosol valve and adapted to be locked for brushing manipulation.

3,592,552

WRITING INSTRUMENT

Curtis L. Malm, Norwalk, Calif., assignor to The Gillette Company, Santa Monica, Calif.

Filed May 16, 1969, Ser. No. 825,190
Int. Cl. B43k 8/00
U.S. Cl. 401—202 5 Claims



A writing instrument having a forward writing point portion and a removable cap therefor, the cap and writing por-

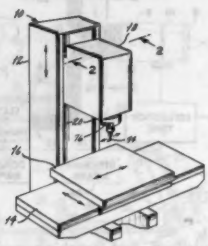
tions each including internal thin-walled collarlike cylindrical portions whose free ends cooperate with sections of the opposite removable port to provide a tight seal.

3,592,553

BORING TOOL ASSEMBLY

Charles K. Heizer, c/o United Engineering Company P.O. Box 165, Imperial, Mo.

Filed Nov. 12, 1968, Ser. No. 774,675
Int. Cl. B23b *29/03*
U.S. Cl. 408—124 **6 Claims**



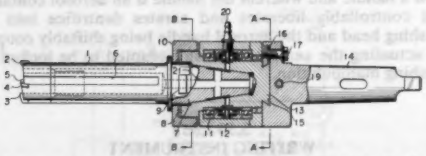
A boring tool assembly is comprised of a vertically disposed spindle rotatably mounted within a spindle housing about a vertical axis, spindle drive means adapted to rotate the spindle, a horizontal guide track rigidly secured to the bottom of the spindle, a block member movably received in the guide track, a cutting tool operatively secured to the block member, and a movable block adjustment means within the spindle engaging the block member for moving it along the guide track. The block adjustment means includes a shaft member movably mounted within the spindle and bearing against a bearing portion of the block member. The shaft member is movable between a first position and a second position by a drive means so that movement of the shaft member forces the block member to move horizontally along the guide track.

3,592,554

TREPAN BORING TOOL

Akio Takahara, No. 49-40, Oaza Otogane, Ohno-machi, Chikushi District, Fukuoka, Japan

Filed July 22, 1969, Ser. No. 843,342
Claims priority, application Japan, Aug. 5, 1968, 43/55341
Int. Cl. B23b *51/04*
U.S. Cl. 408—204 **3 Claims**



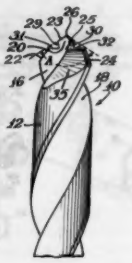
A trepan boring tool comprises a blade-holding cylinder provided on its free end face with a plurality of blades projecting from said end face, the first cutting blade having its tip projecting radially outwardly of the outer periphery of said blade-holding cylinder, the second blade spaced away from said first blade through an angle of about 180° and having its tip projecting radially inwardly of the inner periphery of said cylinder, the remaining blades being arranged to be performable work upon an intermediate part of thickness of a workpiece between the paths of said first and second blades, and means for laterally shifting the axis of said cylinder with respect to a tool shank axis which may be fitted in the machine, the arrangement being such that said cylinder is allowed to be eccentrically rotated upon rotation of the main spindle axis of the machine and therefore the adjustment of the cut or cutting inner and outer radii can be effected at will, resulting in an improvement of cutting operation.

3,592,555

DRILL WITH DISCONTINUOUS CUTTING LIPS

Bruce A. Mackey, Sr., Mundelein, Ill., assignor to Radial Lip Machine Corporation

Filed May 2, 1969, Ser. No. 821,199
Int. Cl. B23b *51/02*
U.S. Cl. 408—225 **4 Claims**



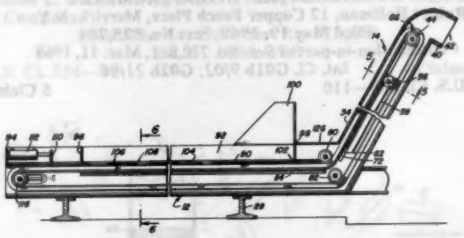
A drill having discontinuous cutting lips defined by a characterized recess formed in each cutting lip adjacent the tip of the drill to provide for longer drill life with improved drilling characteristics in both hard and soft materials.

3,592,556

CONVEYOR WITH NUB BELT

David R. Campbell, Salt Lake City, Utah, assignor to David R. Campbell; Charles N. Campbell and Doyle L. Green, part interest to each

Filed Nov. 21, 1966, Ser. No. 596,003
Int. Cl. F04b *19/14*; B65g *47/18*; F04b *19/16*
U.S. Cl. 415—129 **8 Claims**



A means and method of elevating liquids and semiliquids employing a conveying belt having nubs projecting from the working face, the nubs are not oriented in transverse alignment but are mismatched in a particular manner depending upon the materials being conveyed; the belt may have a confined area in which to travel in the form of a rectangular tube, thereby allowing virtually no space for roll back of the materials.

3,592,557

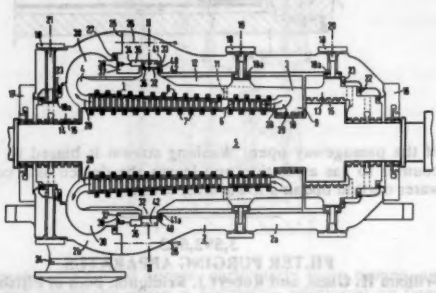
DEVICE FOR AXIALLY FIXEDLY AND RADIALLY DISPLACEABLY MOUNTING TURBINE CASING PARTS

Horst Haas, and Axel Remberg, both of Mulheim-(Ruhr) Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Dec. 2, 1969, Ser. No. 881,443
Claims priority, application Germany, Dec. 3, 1968, P 18 12 490.18
Int. Cl. F01d *25/26*
U.S. Cl. 415—136 **7 Claims**

Device for mounting the inner casing shell of a turbomachine of multishell construction so that it is axially fixed

and radially displaceable and is centered with respect to the outer casing of the turbomachine includes an annular collar located on an annular shoulder formed at the inner periphery of the outer casing for holding the inner shell radially displaceably centered and steamtight, a ring member slidable over the outer periphery of the inner shell from one side of the annular collar facing the steam exhaust side of the turbomachine so as to axially fix the annular collar against displacement by steam pressure from the other side of the annular collar which faces the steam inlet side of the turbomachine, the ring member being anchored to the outer casing, the inner periphery of the outer casing being formed with an annular groove axially adjacent the one side of the annular collar, a closed holder ring having a plurality of axially extending divisions therein and comprising a plurality of ring parts radially insertable in the annular groove and formlockingly assemblable into the closed holder ring so that a face area thereof abuts the annular collar and fixes the inner shell against axial displacement, and a support ring at least partly overlapping the inner periphery of the holder ring for fixing the latter against radial displacement.



3,592,558

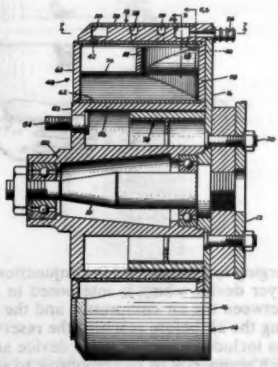
PRESSURE FLUID OPERATED MOTOR

Robert G. Bandy, 10206 Lima Road, Fort Wayne, Ind.

Filed Dec. 10, 1969, Ser. No. 883,812

Int. Cl. F01d *1/02, 1/30*

U.S. Cl. 415—186 **14 Claims**



The present invention is an air motor adapted especially for use in propelling automobiles. It includes a rotor having a plurality of circumferentially arranged pressure chambers closed on all sides and bottom but open at the rotor periphery. A stationary housing at least partially encloses the rotor, the latter being rotatably mounted therein. The housing includes a cylindrical shroud which completes the closure of said chambers at the rotor periphery. The chambers are arranged in laterally adjacent pairs, each chamber being of triangular shape. There are a plurality of said pairs circumferentially contiguously arranged around the entire rotor. Means are provided for introducing and exhausting pressure fluid selectively to and from said chambers. One circumferential series of said chambers, consisting of one chamber of each pair, serve in propelling the rotor in one direction and the remaining chambers serving as a second series to propel the rotor in the opposite direction.

The means for introducing and exhausting pressure fluid to and from said chambers, respectively, are in the form of passages in the housing shroud, these passages being equally spaced circumferentially about the shroud with the exhaust passage being alternated with the inlet passages. The spacing between adjacent inlet and exhaust passages is such that as pressure fluid is being introduced into one chamber, pressure fluid from an adjacent chamber is being exhausted. Circumferentially adjacent chambers are separated by radially disposed walls which serve as impellers and over which a pressure differential can be created for causing movement of the rotor in a predetermined direction.

The chambers and air passages communicating therewith are so constructed as to conserve pressure fluid in the development of the rotational forces.

3,592,559

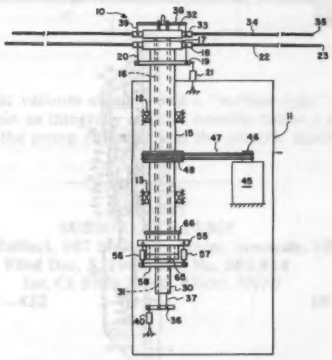
VARIABLE GEOMETRY ROTOR SYSTEM

John F. Ward, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Aug. 28, 1969, Ser. No. 853,746

Int. Cl. B64c *27/10, 27/80*

U.S. Cl. 416—121 **10 Claims**



This rotor system is designed to control the nonuniform wake shed from a given rotor blade impinging upon the other blades of the rotor system. The rotor system utilizes blade sets which are of a different diameter than another blade set in the system. The azimuth spacing between the blade sets can be varied while the aircraft is in flight. The vertical spacing between the blade sets can also be changed. Mechanism is provided for collective pitch control of the blade sets. The plan form of blade sets, as well as the configuration of their tips, are varied.

3,592,560

AIR-OPERATED EDUCTOR CONTROL

Ryan D. Mitchell, Oklahoma City, Okla., assignor to Davis Industries, Inc., Thomasville, Ga.

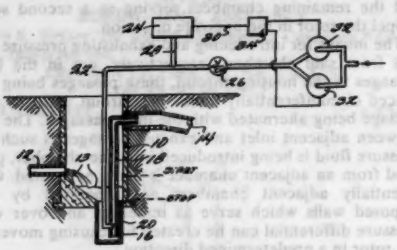
Filed Apr. 7, 1967, Ser. No. 629,325

Int. Cl. F04b *49/06;* **F04f** *1/18*

U.S. Cl. 417—44 **9 Claims**

A liquid waste collection tank is provided with an airlift for periodically pumping out the waste. The airlift comprises an upright eductor pipe dipping into the waste, an air supply line connecting with the submerged portion of the eductor pipe and a blower system for delivering compressed air to the supply line. The air pressure in the supply line varies with the liquid level in the tank, and a pressure responsive control

system is operative to activate and deactivate the blower system at predetermined high- and low-liquid levels in the tank, respectively. A loss of pressure in the supply pipe occasioned by a leak will render the normal control elements inoperative, but a safety element responsive to a pressure drop will activate the blower system to prevent flooding of the tank.

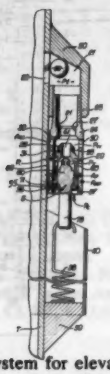


3,592,561

DIFFERENTIAL CONTROL GAS LIFT SYSTEM

David V. Chenoweth, Houston, Tex., assignor to Baker Oil Tools, Inc., Commerce, Calif.

Filed Nov. 25, 1968, Ser. No. 778,721
Int. Cl. F04f 1/18
U.S. Cl. 417—114 18 Claims



A well bore gas lift system for elevating well bore liquids through a tubing string to the surface of the well bore. A main pressure differential valve controls the feed of gas from the tubing-casing annulus into the tubing string, the main valve containing a pilot pressure differential valve that also controls the gas feed from the tubing-casing annulus into the tubing string. The pilot or normal high differential pressure valve opens to admit gas to the tubing string on reduction of the casing-to-tubing differential pressure. This action further reduces the casing-to-tubing differential pressure, causing opening of the main valve, both valves then being open. The pilot valve first opens, assisting opening of the main valve. The main valve first closes, assisting closing of the pilot valve.

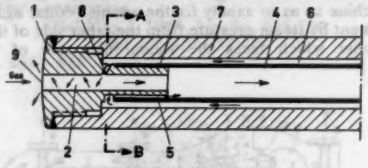
3,592,562

TAKEOFF FOR HOT DUSTY GASES

Heniz Spliethoff, 668 Wellesweiler, Auf den Hanbuchen, Germany

Filed Nov. 12, 1969, Ser. No. 875,732
Claims priority, application Germany, Nov. 14, 1968, P 18 08 886.3
Int. Cl. F04f 5/44; G01n 1/24
U.S. Cl. 417—160 5 Claims

A takeoff using injector action to aspirate dirty furnace gas from a sample zone and force it to an analyzer. Part of the water used for injector action is used to scavenge and rinse the walls of the gas takeoff passageway, with centrifugal force of water rotation holding the major cross-sectional area of the passageway open. Washing stream is biased to move counter to gas aspiration and leaves the device as a conical water curtain opening toward the furnace.

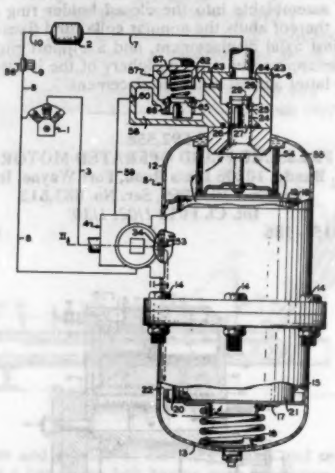


3,592,563

FILTER PURGING APPARATUS

William H. Glass, and Robert J. Bridigum, both of Pittsburgh, Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Dec. 30, 1968, Ser. No. 787,895
Int. Cl. F04b 19/00
U.S. Cl. 417—307 3 Claims

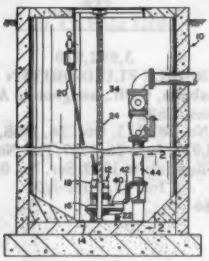


A filter purging apparatus used in conjunction with a desiccant-type dryer device which is interposed in a compressed air system between the air compressor and the storage reservoir for drying the air before reaching the reservoir, the purging apparatus includes a control valve device arranged in the system in such manner as to be responsive to supply of compressed air from the compressor during the cut-in stage of the compressor for effecting flow of said compressed air to the storage reservoir through the dryer, and responsive to control pressure supplied thereto, upon operation of the governor device in cutting out the compressor, for cutting off charging of the storage reservoir and opening a restricted passage to atmosphere via which dry air from the reservoir flows reversely through the dryer device to atmosphere, at a restricted rate, for purging the desiccant in the dryer of moisture accumulated therein, such reverse flow and purging continuing until the governor device restores the compressor to its cut-in or compressing stage.

3,592,564
MOVABLE PUMP WITH FLANGE HAVING SEALING MEANS THEREON

William J. Conery, Ashland, Ohio, assignor to Hydr-O-Matic Pump Company, Hayesville, Ohio

Filed Feb. 24, 1970, Ser. No. 13,282
Continuation-in-part of Ser. No. 853,337, Aug. 27, 1969
Int. Cl. F04d *13/02*; B67d *5/40*; F16l *25/00*
U.S. Cl. 417—360 7 Claims

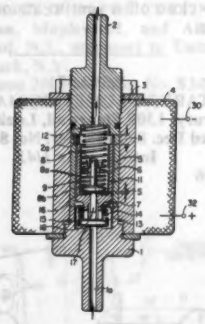


Movably positioned pumps, particularly sump pumps, are provided where the pump is accurately positioned on fixed guide means for controlled vertical movement into and out of a sump. The pump has a discharge member with an end flange thereon, and a fixedly positioned discharge tube means having an end flange thereon is present whereby when the pump is operatively positioned, its discharge opening is aligned with and immediately adjacent the end flange on the discharge tube means. A flexible seal means is carried by the discharge member flange and is forced into sealing engagement with the adjacent flange when the pump is in service.

3,592,565
ARMATURE PUMP

Siegfried Kofink, Zell (Neckar), Germany, assignor to J. Eberspacher, Esslingen (Neckar), Germany

Filed July 8, 1969, Ser. No. 839,815
Claims priority, application Germany, Dec. 5, 1968, P 18 12 830.8
Int. Cl. F04b *35/05*
U.S. Cl. 417—417 4 Claims

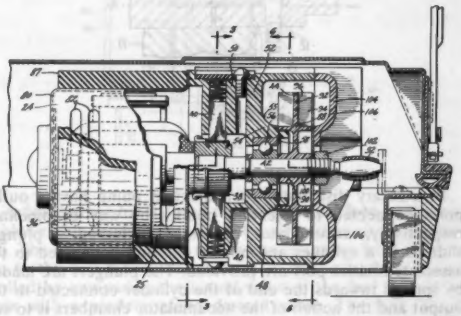


An oscillating armature pump comprises a reciprocable armature piston having a pumping passage defined therethrough with a valve seat. The pump includes a housing having an inlet with an inlet valve seat which is closed by a suction valve member having a stem which extends through the piston opening and holds a piston valve off the seat of the piston opening in the inoperative position of the pump piston. The pump piston advantageously includes an extension through which it transmits a closing force to the suction valve in the inoperative position of the piston as a result of the biasing action of the main pump spring. The valve stem extension of the suction valve itself, also acts on the piston valve to maintain it off its seat by a small gap in the inoperative position. The piston valve is advantageously acted upon by the combined force of a pump spring and a pressure valve spring which is confined within a cage which is under biasing contact by the pump spring. The piston has a sleeve portion which is adapted to engage with the outlet member of the housing to limit the pump stroke.

3,592,566
ELECTRIC VACUUM CLEANER WITH TURBINE-TYPE SUCTION PUMP

Robert M. Beardslee, Willowick, Ohio, assignor to General Electric Company

Filed July 17, 1969, Ser. No. 842,550
Int. Cl. F04d *25/06*, *17/08*; A47l *5/00*
U.S. Cl. 417—423 13 Claims

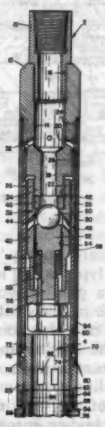


An electric vacuum cleaner with a "turbine-type" suction pump wherein an integrally molded member forms a substantial part of the pump chamber and the electric motor housing.

3,592,567
SUBSURFACE PUMP

Clifford C. Tolbert, 907 McKinley Street, Seminole, Okla.

Filed Dec. 5, 1969, Ser. No. 882,614
Int. Cl. F04b *21/00*, *47/00*, *39/10*
U.S. Cl. 417—432 10 Claims



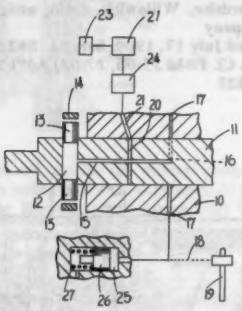
A subsurface pump for a producing oil well, and the like, wherein a passageway is provided for directing a lubricant into the annulus between the working barrel and pump plunger for facilitating the reciprocation of the plunger.

3,592,568

LIQUID FUEL INJECTION PUMPING APPARATUS

Ivor Fenne, Greenford, England, assignor to C.A.V. Limited, London, England

Filed Aug. 4, 1969, Ser. No. 847,163
Claims priority, application Great Britain, Aug. 13, 1968, 38603/68
Int. Cl. F04b *11/00*; F02m *39/00*
U.S. Cl. 417—540 1 Claim



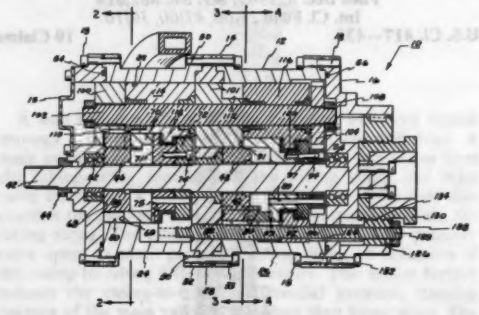
In a rotary distributor fuel injection pump having outlet ports connected to injection nozzles by way or pipelines respectively, accumulator chambers including a plunger slidable in a cylinder and having one end connected to the associated outlet port are provided. The plungers are loaded by springs towards the end of the cylinder connected to the output and the action of the accumulator chambers is to stabilize the pressure existing in the outlet and the pipeline at the end of injection of fuel.

3,592,569

VARIABLE DISPLACEMENT FLUID DEVICE

Doyle V. Rowland, 13909 Gottschalk Road, Plymouth, Mich.

Filed Aug. 22, 1969, Ser. No. 852,268
Int. Cl. F01c *21/16*, *1/08*, *11/00*
U.S. Cl. 418—21 10 Claims



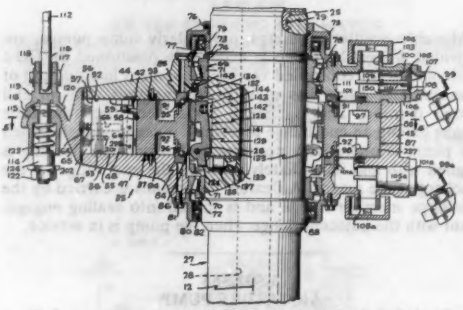
A rotary fluid pressure energy translating device of the variable displacement type having inlet and outlet ports connected by means of a pair of working chambers each of which has a single vane primary rotor, rotatably mounted on an input shaft, the axis of which coincides with the axis of the working chambers. The single vane on each primary rotor engages the circumferential walls of its associated working chamber in a fluid sealing engagement. A secondary rotor is associated with each of the working chambers and extends therein to form a fluid sealing engagement with the inner and outer circumferential walls of the working chamber and the outer periphery of the rotor is rotatably mounted about a second shaft the axis of which is parallel to but displaced from the primary rotor input shaft. Each of the secondary rotors is provided with a recess which comes into position at the appropriate time to permit the vane to pass thereby, while maintaining the required fluid seal during the balance of the cycle of the device. Each of the working chambers has one of its circumferential walls axially shiftable relative to the opposite circumferential wall of its associated working chamber so as to vary the axial length of the working chamber and thereby reduce the effective displacement of the device. The single vanes mounted on each of the rotors are so arranged that they alternately engage the walls of their associated working chambers so as to provide a continuous displacement of fluid between the inlet and outlet ports of the device.

3,592,570

REVERSIBLE FLUID-DRIVEN MOTOR

Josef Bartos, Anaheim, Calif., assignor to Abegg and Reinhold Co., Los Angeles, Calif.

Division of Ser. No. 787,113, Dec. 26, 1968, which is a division of Ser. No. 648,913, June 26, 1967, Pat. No. 3,461,974.
Filed July 6, 1970, Ser. No. 052,262
Int. Cl. F01c *1/00*
U.S. Cl. 418—186 7 Claims



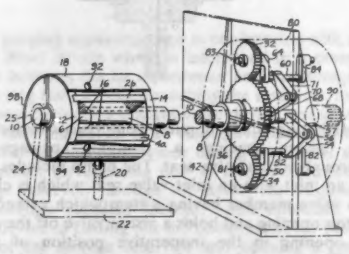
A reversible fluid-driven motor having two selectively usable fluid inlet passages for introducing pressure fluid to the motor to drive it in two opposite directions, with each passage being vented to atmosphere during periods when fluid is being admitted to the motor through the other passage, and with two valve units being provided between a source of pressure fluid and the two passages respectively and each operable automatically when pressure fluid is supplied thereto to close off a vent to atmosphere from the associated passage.

3,592,571

ROTARY VOLUMETRIC MACHINE

Chauncey R. Drury, 1308 Stonewall, Louisville, Ky.

Filed Dec. 8, 1969, Ser. No. 883,178
Int. Cl. F01c *1/42*
U.S. Cl. 418—36 14 Claims



Rotary volumetric machines of the type having spaced pairs of oppositely disposed sector-shaped pistons can be adapted as pumps, compressors, and engines. This machine is driven by a simplified and direct driving means due to the unique piston supporting means. One pair of pistons is held by a quill shaft and the other pair by a hollow shaft or sleeve

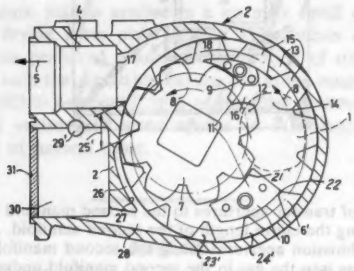
surrounding the shaft, the construction being such that the shaft and sleeve can be directly driven. The driving motion is transmitted to the solid shaft and to the hollow shaft by off-center devices.

3,592,572

PUMP PARTICULARLY FOR PASTY MEDIA

Karl Schnell, Karlstrasse, 7065 Winterbach, Germany

Filed June 4, 1969, Ser. No. 830,591
Claims priority, application Germany, June 4, 1968, Sch 45 022
Int. Cl. F01c *1/10*
U.S. Cl. 418—169 11 Claims



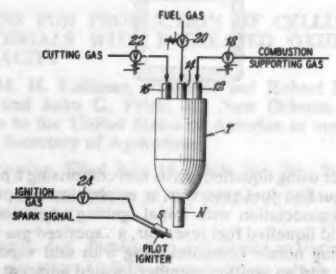
A pump, particularly for pasty media, includes a housing having a suction inlet and a compression discharge passage and an intermediate vacuum exhaust outlet. An outer planetary gear is arranged within the cylindrical space of the housing and a pinion is maintained in engagement with the planetary gear by means of peripherally arranged spaced guide pieces. The rotation of the two gears permits the taking in of the material through the suction and the delivery through the outlet passage. The housing is arranged so that there is a peripheral portion between the suction and the outlet which provides an outer guide for the planetary gear and which forms a spacing between the inlet and outlet which is at least equal to the width of the space between the teeth of the planetary gear. In addition, there is a similar housing portion defined between the outlet and the vacuum exhaust outlet.

3,592,573

FLAME IGNITION SYSTEM FOR CUTTING MACHINES

George H. Tikijian, Maplewood, and Alexander Jordan, Cranford, both of, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 20, 1969, Ser. No. 834,996
Int. Cl. F23c *3/02*
U.S. Cl. 431—1 2 Claims



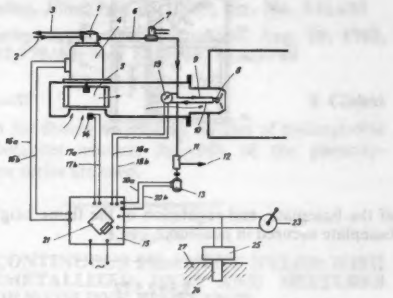
A method of establishing a self-sustaining high-velocity oxyfuel preheat gas flame comprising pulsating the flow of the preheat gas while igniting same, at a rate such that the average gas velocity is rendered nearly equal to the rate of flame propagation.

3,592,574

FUEL BURNER WITH FUEL FEED CONTROL MEANS RESPONSIVE TO AIR AND FUEL FLOW

Kurt Zenkner, Hertzstrasse 12, Ettlingen, Germany

Filed Nov. 5, 1968, Ser. No. 773,543
Claims priority, application Germany, Nov. 6, 1967, P 15 51 993.4
Int. Cl. F23n *1/02*
U.S. Cl. 431—90 1 Claim



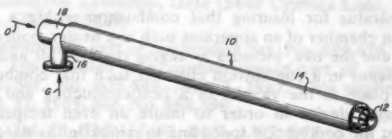
A fuel burner has a spray nozzle with fuel feed means and a blower for producing a flow of combustion air to the nozzle. The device includes a return line returning from the nozzle to the fuel source and a valve in this line which is controlled by comparing the actual value of the fuel flow or air flow with a predetermined desired value. The fuel flow is measured by a device which is connected both to the inlet and return lines of the fuel nozzle.

3,592,575

BURNER NOZZLE TIP

Kurt S. Jaeger, Hurst, and Ross Forney, Dallas, both of, Tex., assignors to Forney Engineering Company, Dallas, Tex.

Filed July 25, 1969, Ser. No. 844,859
Int. Cl. F23d
U.S. Cl. 431—114 2 Claims



A fuel burner is provided in which the nozzle tip is formed with a frustoconical end wall integrally connected to a cylindrical outer wall and the walls have a common central axis. The outer walls are formed with a series of orifices which comprise equally spaced apart rows of orifices, positioned in straight lines that are parallel to the central axis of the walls.

3,592,576

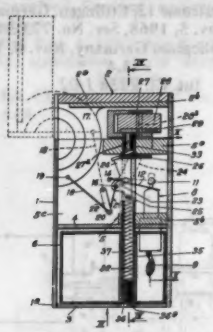
MECHANISM FOR REGULATING THE FLAME HEIGHT IN A GAS LIGHTER

Robert Raymond Hocq, Boulogne-Billancourt, France, assignor to Societe Franco-Hispano-Americaine, Francispam, Paris, France

Filed Mar. 26, 1969, Ser. No. 810,532
Claims priority, application France, Mar. 29, 1968, 146,320
Int. Cl. F23q *2/08, 2/16*
U.S. Cl. 431—131 9 Claims

A gas lighter having a screw which is employed to perform four functions, namely, securing in position a removable baseplate, permitting the supply of a new flint without

removal of the baseplate, replacement of an empty or faulty gas reservoir by a full or properly working one after removal

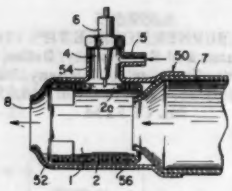


of the baseplate, and regulation of the flame height with the baseplate secured in position.

3,592,577
APPARATUS FOR PROMOTING COMPLETE COMBUSTION

Siegfried Kofink, Zell (Neckar), Germany, assignor to J. Eberspacher, Esslingen am Neckar, Germany

Filed July 3, 1969, Ser. No. 838,737
Claims priority, application Germany, Oct. 18, 1968, P 18 03 815.8
Int. Cl. F23d 13/24
U.S. Cl. 431—263 3 Claims



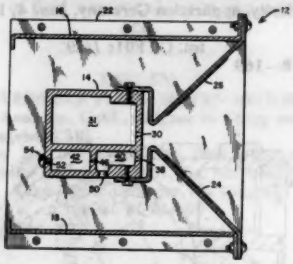
Apparatus for insuring that combustion within a combustion chamber of an apparatus such as a heater, boiler, furnace, and the like, includes arranging the fuel, air and ignition means in a combustion chamber such that combustion takes place in the vicinity of a heat-conducting and heat-equalizing device in order to insure an even temperature zone at the combustion space and to minimize the danger of carbonizing or coking. The heat-conducting and heat-equalizing device comprises preferably a hollow body made of a material providing good heat conduction and heat-equalizing characteristics, such as a mass of a metal material having a capillary action on liquid contacted thereby. The hollow body is advantageously filled with a liquid such as sodium and the material of the metal body, for example, a spun copper or a braid metal material is such that by capillary action the heat is distributed by the liquid uniformly over the entire surface of the body. The heat-conducting and heat-equalizing body is arranged directly in a space where the major portion of the combustion is to take place.

3,592,578
GAS BURNERS

Richard N. Weatherston, Saint Paul, Minn., assignor to Weather-Rite Manufacturing, County of Ramsey, Minn.

Filed Jan. 23, 1970, Ser. No. 5,166
Int. Cl. F23q 9/00
U.S. Cl. 431—278 5 Claims

A gas burner formed from an elongated hollow extrusion having three manifolds formed therein. One of the manifolds comprises a high-pressure manifold delivering raw gas through a series of apertures to the main flame while the second manifold delivers a combustible gas and air mixture through a second series of apertures to the pilot or low-heat flame. The third manifold delivers high-pressure gas through

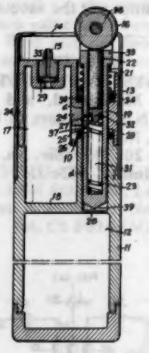


a series of transfer apertures to the second manifold periodically along the entire length of the second manifold. A series of air admission apertures along the second manifold allow air to pass into the gas in the second manifold under the influence of aspiration.

3,592,579
LIGHTER USING LIQUEFIED GAS AS FUEL

Yoshinao Wakamatsu, Tokyo-to, Japan, assignor to Yasuhisa Ebine, Ota-Ku, Tokyo-to, Japan

Filed Feb. 3, 1970, Ser. No. 008,234
Claims priority, application Japan, Feb. 13, 1969, 44/10862
Int. Cl. F23q 1/04
U.S. Cl. 431—254 17 Claims



A lighter using liquefied gas as fuel comprising a previously sealed liquefied fuel reservoir, a mechanism adapted to be moved in association with initial igniting operation for unsealing said liquefied fuel reservoir, a vaporized gas reservoir, a gas-jetting nozzle communicating with said vaporized gas reservoir, and an ignition member located adjacent said nozzle, wherein said mechanism adapted to be moved in association with initial igniting operation for unsealing said liquefied fuel reservoir establishes a communication between said liquefied fuel reservoir and the vaporized gas reservoir and interrupts this communication by its automatically restoring operation.

CHEMICAL

3,592,580

STABILIZING THE COLOR OF WOOD

Gilbert F. Hoffmann, Mukwonago, Wis., assignor to O'Neil Duro Company, Milwaukee, Wis.

No Drawing. Filed Oct. 6, 1967, Ser. No. 673,274

Int. Cl. B27k *5/02*

U.S. Cl. 8—6.5 11 Claims

A low concentrate aqueous solution of an oxidizing agent selected from the group comprising potassium permanganate, the water soluble chromates and dichromates and chromic acid is applied in a quantity small enough so that drying takes place rapidly. Ammonium dichromate gives preferred results. Concentration of oxidizing agent is such that available oxygen lies in the range from about 0.025% to about 0.30% of the total aqueous solution and varies with wood species in accordance with darkness of natural color.

3,592,581

DYEING OF HUMAN HAIR WITH INSOLUBLE PHTHALOCYANINE DYESTUFFS IN A CATIONIC DISPERSION

Albert Shansky, Norwalk, Conn., and Alan Gary Schuster, Amityville, N.Y., assignors to Del Laboratories, Inc., Farmingdale, N.Y.

No Drawing. Filed Aug. 8, 1968, Ser. No. 751,075

Int. Cl. A61k *7/12*

U.S. Cl. 8—10.1 3 Claims

A system for semi-permanently dyeing human hair by plating out a water insoluble phthalocyanine dyestuff onto a cationic layer ensheathing hair strands and acting as a dye coupler for the dyestuff. The cationic layer is applied to the hair strands from an aqueous medium in which the cationic material and water insoluble phthalocyanine dyestuff constitute a single composite mixture with the cationic compound as an ingredient in intimate contact with the dyestuff and acting as a dispersant so as to obtain uniform distribution of the dyestuff in the aqueous medium and leveling of the dyestuff as a waterfast dye on the hair substrate.

3,592,582

PROCESS FOR PRODUCTION OF CELLULOSIC MATERIALS WITH INCREASED OXIDIZING CAPACITY

Russell M. H. Kullman, Metairie, and Robert M. Reinhardt and John G. Frick, Jr., New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed July 10, 1968, Ser. No. 743,611

Int. Cl. D06m *13/08, 13/34, 13/12*

U.S. Cl. 8—115.6 18 Claims

A process for producing cellulosic materials with oxidizing capacity. Cellulosic material to which a carbamate-formaldehyde adduct has been applied, is treated with hypobromite solution. After treatment with hypobromite solution the textile retains positive bromine and has high oxidizing capacity.

3,592,583

DYEING OR PRINTING CELLULOSIC FIBERS AND SYNTHETIC HYDROPHOBIC ORGANIC SUBSTANCES WITH PHENOXYBENZANTHRONE DYES

Paul Buecheler, Reinach, Basel-Land, and Fred Mueller, Munchenstein, Basel-Land, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

No Drawing. Filed July 17, 1969, Ser. No. 842,680

Claims priority, application Switzerland, Aug. 29, 1968, 12,970/68; Nov 12, 1968, 16,828/68

Int. Cl. C09b *3/08*

U.S. Cl. 8—39 6 Claims

A process for dyeing or printing textiles of hydrophobic organic substances wherein dyestuffs of the phenoxybenzanthrone series are used.

3,592,584

DYEING CONTINUOUS FILAMENT NYLON WITH 1:1 PREMETALLIZED DYES AND MIXTURES THEREOF WITH DYE ASSISTANTS

William J. Link and Hermann W. Pohland, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 23, 1968, Ser. No. 699,773

Int. Cl. D06p *1/10*

U.S. Cl. 8—26 13 Claims

Improved process for level, lightfast dyeing of polyamide fibers and textile articles comprised thereof by contacting same with an aqueous dye bath containing specific 1:1 premetallized dyes (I, II and III), dyeing assistant and, preferably, metal complexing agent.

3,592,585

METHOD AND APPARATUS FOR TREATING SHEET-LIKE MATERIAL AND THE LIKE

Robert R. Candor, Miami Township, Ohio (5940 Munger Road, Dayton, Ohio 45459), and James T. Candor, Washington Township, Ohio (5440 Cynthia Lane, Dayton, Ohio 45429)

Continuation-in-part of application Ser. No. 690,636, Dec. 14, 1967, which is a continuation-in-part of application Ser. No. 635,848, May 3, 1967. This application Oct. 22, 1969, Ser. No. 868,396

Int. Cl. F26b *13/02;* B05b *3/02;* B05c *8/04*

U.S. Cl. 8—151 14 Claims

Supporting means receiving sheet-like material and conveying the same in substantially flat form and movable nozzle means having an end means provided with opening means and engaging against the material for a predetermined substantially straight line length of travel therewith, the nozzle means comprising a flexible sheet means at least partially surrounding the opening means and defining the end means thereof and providing a fluid flow between the opening means of the nozzle means and the section of material aligned between that opening means and the supporting means to treat that section of material with

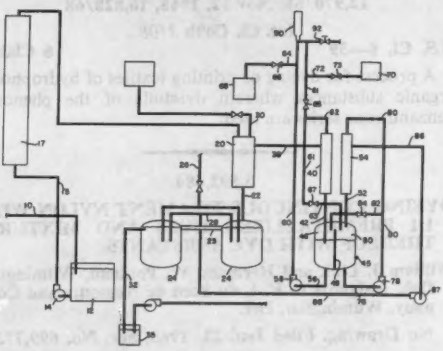
fluid. Means are provided for causing the end means to be disposed in substantially sealed relation with the section of material engaged thereby by creating a pressure differential across the sheet means to cause one side thereof to press against the material on the supporting means.

3,592,586

METHOD FOR TREATING CYANIDE WASTES

Lewis F. Scott, Indianapolis, Ind., assignor of fractional part interest to Franke Plating Works, Inc., Fort Wayne, Ind.

Filed Feb. 17, 1969, Ser. No. 799,609
Int. Cl. C01c *3/10*; B01j *1/00*
U.S. Cl. 23—79 4 Claims



A method and apparatus for converting cyanide wastes into sodium cyanide in which said wastes are heated and pumped into a first tank containing an acid solution to produce hydrogen cyanide. The hydrogen cyanide is then passed through a first tower of sodium hydroxide and a second tank containing a first solution of sodium hydroxide and sodium cyanide. The materials in said second tank are recycled therethrough and through said first tower to produce the sodium cyanide reaction product which is then withdrawn from said second tank. During said recirculation, vaporized hydrogen cyanide is withdrawn from said second tank and passed and recycled through a second tower of sodium hydroxide and a third tank to produce a second solution of sodium hydroxide and sodium cyanide which is pumped into said second tank at the start of the next conversion cycle to form said first solution therein.

3,592,587

METHOD OF PROCESSING ACID WASTES FROM THE PROCESS OF CHLOROMETHYLATING COPOLYMERS OF STYRENE AND COMPOUNDS OF THE VINYLAROMATIC SERIES

Arkady Borisovich Pashkov, Khoroshevskoe shosse 74, korpus 3, kv. 56, Moscow, U.S.S.R.; Nikolai Mikhailovich Vdovin, Ulitsa Ordzhonikidze 5, kv. 5; and Olga Nikolaevna Voronkova, Ulitsa Dzerzhinskogo 2b, kv. 37, both of Kemerovo, U.S.S.R.; Roza Romanovna Dranovskaya, Stantsia Tarasovka, Voxalny Tupik 46, Moscow, U.S.S.R.; Anatoly Mikhailovich Egorov, Vesennaya ulitsa 19, kv. 104, Kemerovo, U.S.S.R.; Afanasy Filippovich Kljushnev, Dnepropetrovskoi oblasti, ulitsa Kapitanov 4, kv. 66, Dneprodzerzhinsk, U.S.S.R.; Petr Ivanovich Shatrin, Ulitsa Vesennaya 13, kv. 74; Mikhail Yankelevich Zeigman, Sovetsky prospekt 87, kv. 26; and Vyacheslav Patrushev, Ulitsa Vesennaya 19, kv. 5, all of Kemerovo, U.S.S.R.; and Yakov Vulfovich Epshtein, Ulitsa Pervomaiskaya 85, kv. 10, Moscow, U.S.S.R.

No Drawing. Filed July 31, 1968, Ser. No. 748,905
Int. Cl. C01g *9/04*; C07c *43/30*
U.S. Cl. 23—97 3 Claims

A method for processing acid wastes, which consist of monochlorodimethyl ether, hydrochloric acid and salts thereof and which appear as a result of the process of chloromethylating copolymers of styrene and vinylaromatic compounds with monochlorodimethyl ether in the presence of a Friedel-Crafts catalyst, wherein said wastes are treated with an excess of methanol. Next the treated wastes are rectified first at a temperature of 41–44° C. to recover methylal and then at a temperature of 60–70° C. to recover methanol. The still bottoms remaining after rectification may be heated to carbonize organic impurities contained therein, after which the precipitated carbonized impurities are removed, and the remaining still bottoms are evaporated to recover the Friedel-Crafts catalyst.

3,592,588

CRYSTALLINE FORM V AMMONIUM POLYPHOSPHATE AND PROCESS FOR PRODUCING SAME

David R. Dyroff, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed May 28, 1968, Ser. No. 732,506
Int. Cl. C01b *25/28*
U.S. Cl. 23—106 4 Claims

A new crystalline form of ammonium polyphosphate and processes for producing same are disclosed. The new ammonium polyphosphate is a useful ingredient in metal polishes.

3,592,589

METHOD OF REMOVING ALUMINUM FROM BARIUM SULFIDE SOLUTIONS

Vernon R. Horn, Coffeyville, Kans., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Mar. 18, 1969, Ser. No. 808,141
Int. Cl. C01f *11/08, 11/10*
U.S. Cl. 23—134 5 Claims

Aluminum oxide impurities are removed from aqueous barium sulfide solution by contacting the solution with anhydrous magnesia-containing solid particles. The aluminum oxide impurity is reduced below 0.02 gram/liter by this treatment. The preferred magnesium oxide material is calcined magnesite in a particle size smaller than 200 mesh. The magnesium oxide and aluminum oxide solids are separated from the purified solution by filtering or centrifuging the mixture.

3,592,590

FLUOSILICIC ACID PURIFICATION

Warren A. Knarr, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed June 18, 1969, Ser. No. 834,559
Int. Cl. C01b *7/22, 11/24, 33/10*
U.S. Cl. 23—153 3 Claims

Fluosilicic acid containing impurities such as phosphorus pentoxide is purified by admixing it with sulfuric acid, heating the mixture to evolve hydrogen fluoride and silicon tetrafluoride vapors, sweeping the vapor space above the heated mixture with a superheated condensible gas such as steam, and absorbing the SiF_4 and HF vapors in water.

3,592,591

PRODUCTION OF NITRIC ACID

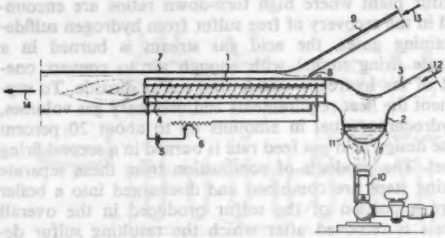
David R. Morrow, Irwin, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Original application Oct. 22, 1965, Ser. No. 500,912, now Patent No. 3,441,380. Divided and this application Oct. 29, 1968, Ser. No. 771,537
Int. Cl. C01b *21/40*
U.S. Cl. 23—162 2 Claims

A nitric acid producing plant employing a refrigeration unit which utilizes energy given off by the chemical reactions productive of nitric acid to cool the substances produced by the chemical reactions and to reduce the

temperature of the plant absorption tower to increase reaction efficiency and decrease reaction time to increase plant efficiency.

3,592,592
PROCESS FOR PREPARATION OF SO_3
Max Schmidt, Wurzburg, Germany, assignor to Research Corporation, New York, N.Y.
Filed May 17, 1968, Ser. No. 730,174
Claims priority, application France, May 19, 1967, 107,110
Int. Cl. C01b *17/68*
U.S. Cl. 23—174 1 Claim



A process for preparing SO_3 is disclosed, wherein sulphur is burned in the presence of an oxygen containing gas and the resultant SO_3 is stabilized to prevent decomposition into SO_2. The stabilization may be by means of a suitable stabilizing compound, such as Lewis base, or may be by way of thermal quenching.

3,592,593
PURIFICATION OF THIONYL CHLORIDE
Benno Böhm, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Dec. 6, 1967, Ser. No. 688,358
Claims priority, application Germany, Dec. 10, 1966, F 50,902
Int. Cl. C01b *17/45*
U.S. Cl. 23—203 6 Claims

Pure thionyl chloride can be obtained from a crude product containing besides sulfur dioxide and chlorine mainly sulfur chlorides contaminates by evaporating the thionyl chloride at a temperature below the boiling point of sulfur monochloride (disulfur dichloride) and contacting the gaseous thionyl chloride with sulfur containing an effective amount of iron or iron-compounds to convert any sulfur dichloride contaminating the gaseous thionyl chloride to liquid sulfur monochloride.

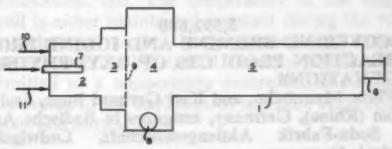
3,592,594
PROCESS FOR THE MANUFACTURE OF PHOSPHORUS PENTAFLUORIDE
Robert A. Wiesboeck, Atlanta, Ga., assignor to United States Steel Corporation, Pittsburgh, Pa.
No Drawing. Filed Jan. 5, 1968, Ser. No. 695,857
Int. Cl. C01b *25/10*
U.S. Cl. 23—205 6 Claims

Phosphoryl fluoride is reacted with sulfur trioxide to form a phosphoryl fluoride-sulfur trioxide adduct and the adduct can be solvolyzed by hydrogen fluoride to form phosphorus pentafluoride and sulfuric acid. The phosphoryl fluoride-sulfur trioxide adduct is a new compound in the form of a colorless liquid having a lower vapor pressure than its individual components by a factor of about 10.

3,592,595
STABILIZATION AND CARBONIZATION OF ACRYLIC FIBROUS MATERIAL
Klaus H. Gump, Gillette, and Dagobert E. Stuetz, Westfield, N.J., assignors to Celanese Corporation, New York, N.Y.
No Drawing. Filed Nov. 21, 1968, Ser. No. 777,901
Int. Cl. C01b *31/07*
U.S. Cl. 23—209.1 22 Claims

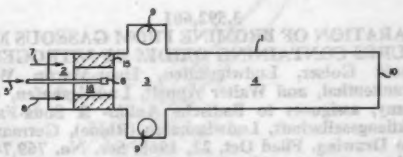
An improved process is provided for the stabilization of an acrylic fibrous material consisting primarily of recurring acrylonitrile units. The fibrous material is subjected to a stabilization treatment in which the starting material is heated while immersed in a solution of a Lewis acid capable of promoting the cyclization of pendant nitrile groups, e.g. a solution of stannic chloride. The exotherm normally exhibited by the precursor upon exposure to heat may be substantially reduced or totally eliminated in an efficient manner by such treatment which is believed to result in a product of improved chemical structure. The resulting product may be directly carbonized or carbonized and graphitized in an inert atmosphere or alternatively next subjected to relatively mild preoxidation conditions prior to treatment in an inert atmosphere. The carbonized or carbonized and graphitized fibrous materials exhibit improved physical properties.

3,592,596
METHOD AND APPARATUS FOR THE PRODUCTION OF CARBON BLACK
Eulas W. Henderson, Borger, Tex., assignor to Phillips Petroleum Company
Filed May 23, 1968, Ser. No. 731,524
Int. Cl. C09c *1/50*
U.S. Cl. 23—209.4 7 Claims



Process and apparatus for the production of carbon black wherein a mixture of hydrocarbon feed and hot combustion gases is expanded in at least one intermediate section of the reactor, the expanded mixture passed into a combustion zone having a diameter greater than the diameter of said intermediate section and contacted therein with additional hot combustion gases, and the resulting mixture passed into a reaction zone wherein the hydrocarbon feed is pyrolytically decomposed into carbon black.

3,592,597
CARBON BLACK PROCESS AND REACTOR
Joseph C. Krejci, Phillips, Tex., assignor to Phillips Petroleum Company
Filed May 23, 1968, Ser. No. 731,523
Int. Cl. C09c *1/50*
U.S. Cl. 23—209.4 10 Claims



Process and apparatus for the production of carbon black wherein an oxygen-containing gas, with or without fuel, is introduced into an axial zone of a reactor and passed through a diametrally restricted section of said

zone wherein it is commingled with a hydrocarbon feed, the mixture passed into a combustion zone and contacted therein with hot combustion gases, and the resulting mass passed into a reaction zone wherein the hydrocarbon feed is pyrolytically decomposed into carbon black.

3,592,598
QUALITY CONTROL IN CARBON BLACK PRODUCTION
Sheldon A. Cunningham and Glenn J. Forseth, Phillips, Tex., assignors to Phillips Petroleum Company
Filed Aug. 23, 1968, Ser. No. 754,819
Int. Cl. C09c *1/50*
U.S. Cl. 23—209.4 8 Claims

A process for controlling the quality of a carbon black which involves determining the pH of the condensate condensed from the off-gases from the reactor, and adjusting the ratio of air to oil charged to the reactor to produce a constant quality carbon black.

3,592,599
QUALITY CONTROL CARBON BLACK PRODUCTION
Gerhard A. Gohlke and John A. Drummond, Borger, Tex., assignors to Phillips Petroleum Company
Filed Aug. 26, 1968, Ser. No. 755,115
Int. Cl. C09c *1/50*
U.S. Cl. 23—209.4 2 Claims

A method for controlling the quality of carbon black produced from the pyrolytic decomposition of a hydrocarbon feed which comprises adjusting the hydrocarbon feed rate to the reactor in response to variations in the water content of the reactant streams, particularly the oxygen-containing gas, fed to the reactor.

3,592,600
RECOVERING BROMINE AND IODINE FROM REACTION PRODUCTS OF OXYDEHYDROGENATIONS
Rolf Platz, Mannheim, and Karl Gerhard Baur, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
Filed Sept. 6, 1968, Ser. No. 757,938
Claims priority, application Germany, Sept. 7, 1967, P 16 43 659.2
Int. Cl. C01c *1/16*
U.S. Cl. 23—216 6 Claims

The recovery of bromine and/or iodine from the reaction products of oxydehydrogenations of hydrocarbons in which bromine and/or iodine serves as a catalyst, wherein the reaction product leaving the reactor is treated with an aqueous ammonia solution to which has been added an amount of hydrazine sufficient for the reduction of the elementary constituents. The aqueous phase is separated and the byproducts containing bromine and/or iodine separated in the working up of the organic phase are burnt with oxygen-containing gases and the gas from the combustion is scrubbed with an ammonia solution containing hydrazine.

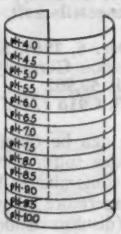
3,592,601
SEPARATION OF BROMINE FROM GASEOUS MIXTURES CONTAINING OXIDES OF NITROGEN
Leopold Golser, Ludwigshafen, Hans-Martin Weltz, Frankenthal, and Walter Appelt, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed Oct. 22, 1968, Ser. No. 769,745
Claims priority, application Germany, Oct. 24, 1967, P 16 67 396.4
Int. Cl. C01b *7/10*
U.S. Cl. 23—216 1 Claim

For the separation of bromine from gaseous mixtures which, in addition to bromine, contain oxides of nitrogen with less than pentavalent nitrogen and with or without nitrosyl bromide, at least as much oxygen is added as is necessary for converting the nitrogen of the oxides or nitrosyl bromide into the pentavalent state. These mixtures are then treated with water or dilute aqueous nitric acid.

3,592,602
HIGH TURN-DOWN RATIO DESIGN FOR SULFUR PLANTS
John W. Palm, Tulsa, Okla., assignor to Pan American Petroleum Corporation, Tulsa, Okla.
Filed Feb. 10, 1969, Ser. No. 797,789
Int. Cl. C01b *17/04*
U.S. Cl. 23—225 3 Claims

To avoid abnormally low temperatures and flow rates in a sulfur plant where high turn-down ratios are encountered in the recovery of free sulfur from hydrogen sulfide-containing gases, the acid gas stream is burned in a separate firing tunnel with enough air to convert one-third of the hydrogen sulfide into sulfur dioxide. To supplement the heat requirements and necessary gas volumes, a hydrocarbon fuel in amounts up to about 20 percent of the design acid gas feed rate is burned in a second firing tunnel. The products of combustion from these separate burning steps are combined and discharged into a boiler where a portion of the sulfur produced in the overall process is removed after which the resulting sulfur denuded stream is processed in conventional fashion.

3,592,603
BROAD SPECTRUM pH INDICATOR AND METHOD
George S. Miller and Robert A. Benson, Indianapolis, Ind., assignors to A. R. Stryker, Lawrenceburg, Ind.
Filed May 1, 1968, Ser. No. 725,860
Int. Cl. C09k *3/30*; G01n *31/22, 33/10*
U.S. Cl. 23—230 4 Claims



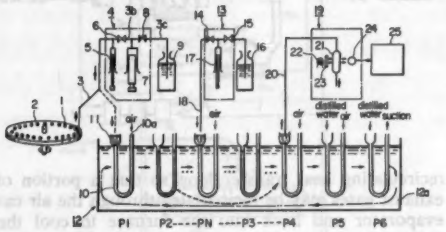
A broad spectrum pH indicator consisting essentially of the combination of methyl red, bromthymol blue, phenolphthalein, and a-naphtholphthalein. The indicator provides thirteen color changes in a range of pH 4–10 and is useful in a novel method of determining pH as a quality control check.

3,592,604
2-(p-DIMETHYLAMINO STYRYL) - 1 - METHYL-QUINOLINIUM CHLORIDE AS AN ANALYZER FOR IODINE
William N. Cottrell, Jr., Indianapolis, Ind., assignor to Bio-Dynamics, Inc., Indianapolis, Ind.
Filed Jan. 23, 1969, Ser. No. 793,334
Int. Cl. G01n *33/16, 21/06*
U.S. Cl. 23—230 5 Claims

2-(p-dimethylamino styryl)-1-methylquinolinium chloride which is produced by the reaction of quinaldine, methylene chloride and p-dimethylamino benzaldehyde in the

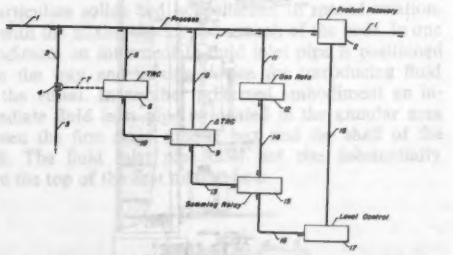
presence of ethyl alcohol and sulfuric acid. This compound is used as an indicator for inorganic and organic bound iodine in body fluids.

3,592,605
AUTOMATIC ANALYZING DEVICE
Masayoshi Noma, Tadao Yamamoto, and Hiroshi Takekawa, Tokyo, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan
Filed Dec. 22, 1969, Ser. No. 887,220
Claims priority, application Japan, Dec. 21, 1968, 43/93,500; Apr. 25, 1969, 44/31,683
Int. Cl. G01n *1/00, 1/14*
U.S. Cl. 23—259 11 Claims



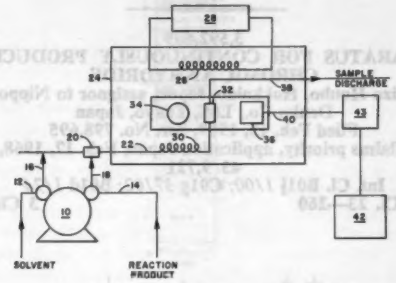
A device for automatic chemical analysis, comprises a sample turret holding a plurality of samples in containers disposed along the periphery thereof. A reaction tank means suspends a plurality of U-shaped reaction tubes movable through the constant-temperature liquid in a thermostatic vessel, and a sample transferring means is provided for transferring each sample from the containers of the sample turret to a selected reaction tube in the reaction tank means, a measuring means is provided for measuring selected properties of the sample by sucking the sample from the U-shaped reaction tube after keeping it in the thermostatic vessel for a certain period.

3,592,606
CONTROL SYSTEM
David M. Boyd, Clarendon Hills, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Sept. 11, 1968, Ser. No. 759,104
Int. Cl. B01j *9/04;* C10g *13/00, 37/02*
U.S. Cl. 23—253 3 Claims



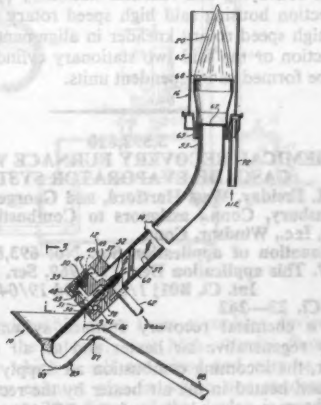
Control system for a hydrocracking reaction zone operating by temperature control on the feed inlet, reset by temperature differential across the catalyst beds. The desired temperature differential is determined by a combination fractionator-level control signal and gas make flow control signal.

3,592,607
APPARATUS FOR CONTINUOUSLY MONITORING THE PROCESS OF CERTAIN REACTIONS
Ronald G. Bruce, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
Division of application Ser. No. 684,578, Sept. 25, 1967, now Patent No. 3,478,111, which is a continuation of application Ser. No. 531,084, Mar. 2, 1966, which in turn is a continuation-in-part of application Ser. No. 180,682, Mar. 19, 1962. This application Feb. 18, 1969, Ser. No. 800,176
Int. Cl. G01n *21/28*
U.S. Cl. 23—253 2 Claims



Apparatus for determining the progress of a reaction between reactants which produce a product whose miscibility in a solvent is related to the extent of reaction. As the reaction proceeds, part of the reaction product is continually mixed with a solvent and flowed through a translucent cell mounted between a light source and a photoelectric cell. The temperature of the sample in the cell is either maintained constant during the reaction or is maintained at the changing miscibility temperature during the reaction by signals from the photoelectric cell transmitted to a temperature controller, and is particularly adapted to the oxylation of aliphatic alcohols, alkylphenols, and fatty acids.

3,592,608
ANALYTICAL INSTRUMENT
John U. White, Contentment Island Road, Darien, Conn. 06820
Filed Oct. 9, 1968, Ser. No. 775,985
Int. Cl. G01j *3/48;* G01n *21/58, 31/12*
U.S. Cl. 23—253 19 Claims



An analytical instrument including a flame source and a detection system for the qualitative and quantitative

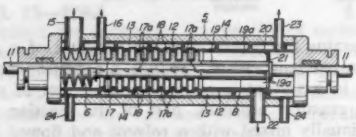
emission or absorption analysis of a sample. The sample is atomized and mixed with an appropriate fuel gas, and the mixture is led through an angularly disposed burner barrel to a grid for holding the flame. Compressed air is supplied to the atomizer, and a portion of the air is directed to a venturi nozzle which is connected to a supply of the fuel gas. The air is effective to draw the fuel gas through the venturi and into the atomizer at a substantially constant rate irrespective of pressure fluctuations in a gas supply. The instrument additionally includes a screen and baffle construction within the angularly extending barrel which is effective to direct large droplets of sample material away from the barrel inlets.

3,592,609

APPARATUS FOR CONTINUOUSLY PRODUCING CHROMIC ANHYDRIDE

Keizo Honbo, Hokkaido, Japan, assignor to Nippon Denko Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1969, Ser. No. 798,695
Claims priority, application Japan, Feb. 17, 1968, 43/9,721
Int. Cl. B01j *1/00*; C01g *37/02*; B01d *1/24*
U.S. Cl. 23—260 **3 Claims**



Apparatus adapted for use in producing chromic anhydride which comprises a stationary cylindrical casing of the externally heated type provided with a jacket in which a high-speed rotary conveyer for forcibly moving an alkali metal dichromate forwardly, a high-speed rotary kneader for mixing and kneading said alkali metal dichromate and sulfuric acid to cause them to react with each other and produce a reaction product while moving them forwardly, and a high-speed rotary centrifugal continuous evaporator adapted to form a thin film of said reaction product on cylindrical inner walls to forcibly effect deaeration of the same, are arranged in the indicated order in end to end relation. In the reactor described above, a stationary cylindrical casing section housing said high speed rotary centrifugal continuous evaporator therein may be formed integrally as a unit with a conveying and reaction stationary cylindrical casing section housing said high speed rotary conveyer and said high speed rotary kneader in alignment with the latter section or the said two stationary cylindrical sections may be formed as independent units.

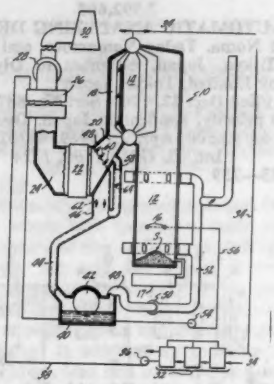
3,592,610

CHEMICAL RECOVERY FURNACE WITH AIR CASCADE EVAPORATOR SYSTEM

Jay H. Freiday, West Hartford, and George J. Prohazka, Simsbury, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation of application Ser. No. 693,891, Dec. 27, 1967. This application Dec. 17, 1969, Ser. No. 882,762
Int. Cl. B01j *1/00*; F28d *19/04*
U.S. Cl. 23—262 **6 Claims**

In a chemical recovery furnace system including a rotary regenerative air heater and an air cascade evaporator, the incoming combustion air supply therefor having been heated in the air heater by the recovery furnace exhaust gases, the placing of the FD (forced draft) fan between the cascade evaporator and the recovery furnace for the purpose of reducing the air-to-gas leakage across the moving seals of the air heater. Also, there is provided a bypass means between the exhaust outlet from the furnace and the inlet side of the air cascade evaporator to, under certain conditions, selectively form a closed



recirculating heat transfer loop so that a portion of the exhaust gases may be recirculated through the air cascade evaporator and back into the furnace to cool the hot molten furnace smelt in order to reduce the possibility of a smelt-water reaction explosion.

ERRATUM

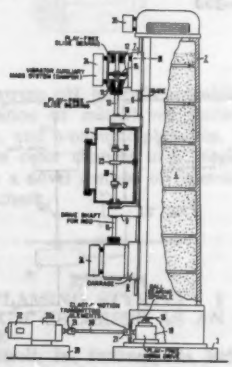
For Class 23—273 see:
Patent No. 3,592,937

3,592,611

FLOATING-ZONE MELTING APPARATUS

Georg Eder, Ebermannstadt-Furth, Reimer Emeis, Ebermannstadt, and Wolfgang Keller, Pretzfeld, Germany, assignors to Siemens Schuckertwerke Aktiengesellschaft, Berlin and Erlangen, Germany

Original application Oct. 22, 1965, Ser. No. 501,690. Divided and this application Oct. 25, 1968, Ser. No. 797,296
Claims priority, application Germany, May 7, 1965, S 96,982
Int. Cl. B01j *17/10*
U.S. Cl. 23—273 **8 Claims**



Apparatus for refining a rod according to the floating-zone melting technique includes rotary shaft means adapted to carry and rotate a rod during subjection thereof to the floating-zone melting technique, play-free worm-drive means operatively connected to the rotary shaft

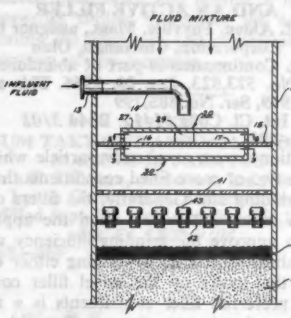
means for rotating the latter, carriage means carrying the rotary shaft means, ball-bearing guide means guiding the carriage means for movement, and rotary ball-bearing spindle means operatively connected to the carriage means for displacing the latter, so that the rod is maintained free of mechanical vibrations during treatment of the rod according to the floating-zone melting technique.

3,592,612

TWO-STAGE APPARATUS FOR MIXING FLUIDS IN CONCURRENT DOWNFLOW RELATIONSHIP

John H. Ballard, 10340 Bogardus Ave., Whittier, Calif. 90603, and Roland F. Deering, 1100 Circle Drive, La Habra, Calif. 96301

Filed Nov. 2, 1966, Ser. No. 591,615
Int. Cl. B01f *3/04, 5/06*
U.S. Cl. 23—288 **11 Claims**



A two-stage fluid mixing device comprising a horizontal tray adapted for installation in a downflow contacting vessel and having a first stage mixing box mounted on its upper surface, a second stage mixing box attached to its under surface and at least two spaced apertures in the tray communicating the mixing boxes. Fluids flowing downwardly within the contacting vessel pass serially through the first stage mixing box, through the apertures in the tray, and then through the second stage mixing box. The contacting vessel includes a horizontal perforate tray extending across the cross-section of the vessel and located immediately below and proximate the mixing device. A horizontal bubble cap tray containing a plurality of downcomers is placed in spaced relationship below the perforated tray and above the solids bed. Each of the downcomers is surmounted by a bubble cap. A plurality of particulate solids bed is positioned in spaced relationship with the mixing device above each of the beds. In one embodiment an intermediate fluid inlet pipe is positioned above the tray and mixing device for introducing fluid into the vessel. In another preferred embodiment an intermediate fluid inlet pipe is located in the annular area between the first stage mixing box and the shell of the vessel. The fluid inlet pipe does not rise substantially above the top of the first mixing box.

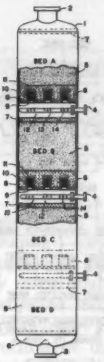
3,592,613

APPARATUS FOR FLUID DISTRIBUTION IN A FLUID-SOLIDS CONTACTING CHAMBER

David M. Boyd, Clarendon Hills, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 30, 1968, Ser. No. 787,843
Int. Cl. B01j *9/04, 9/02*
U.S. Cl. 23—288 **7 Claims**

A fluid distributing means for use in fluid-solids contact chambers containing a plurality of fixed beds of particulated contact solids. The means comprises a plurality of fluid downcomers which encompass openings in an imperforate deck plate and rise a finite distance above the plate. The downcomers are perforated to provide greater open area for fluid flow with respect to increasing distance from the face of the plate. A preferred embodiment is a deck containing downcomer means comprising



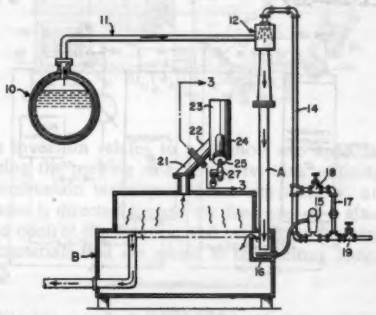
screen means having screen openings of increasing dimension with respect to increasing distance from the deck plate. A further preferred embodiment is a deck containing downcomer means comprising tubular screen means formed by the helical winding of a continuous rod member around a plurality of spaced longitudinal bar members to produce a continuous helical slot opening of continuously increasing slot width.

3,592,614

AFTERBURNER FOR COOKING DEVICE

Carl Oscar Schmidt, Cincinnati, Ohio, assignor to The Cincinnati Butchers Supply Company, Cincinnati, Ohio

Filed Apr. 21, 1969, Ser. No. 818,000
Int. Cl. F23j *5/06;* **F23g** *7/06*
U.S. Cl. 23—290.5 **10 Claims**



The non-condensable gases from a cooking device are incinerated by the intensely hot high velocity flame of an afterburner which is self contained and may be associated with any exhaust pipe in which non-condensable gases are present. The flame of the device is produced in an area in which water from the incinerated gases cannot extinguish the flame.

3,592,615

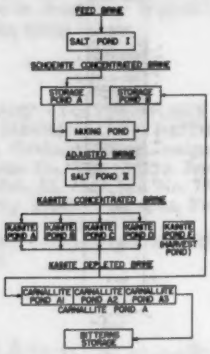
METHOD FOR PRODUCING POTASSIUM SALTS BY SOLAR EVAPORATION OF NATURAL BRINES

Ulrich E. G. Neitzel, Ogden, Utah, assignor to Great Salt Lake Minerals & Chemical Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 735,840, June 10, 1968. This application Aug. 28, 1968, Ser. No. 756,071

Int. Cl. B01d *9/00*; C13k *1/10*

U.S. Cl. 23—297 15 Claims



At the close of an evaporation season, the brines of a solar pond system that include salt ponds, kainite ponds, and carnallite ponds are manipulated to take advantage of the winter weather. The kainite crystal crops are enhanced in grade due to the influence of winter precipitation. Additional potassium-containing and sulfate-containing solids are recovered from the brines under the influence of winter temperatures. Brines produced during the non-evaporation season are stored for use during the next evaporation season, thereby increasing the annual productivity of the solar pond system.

3,592,616

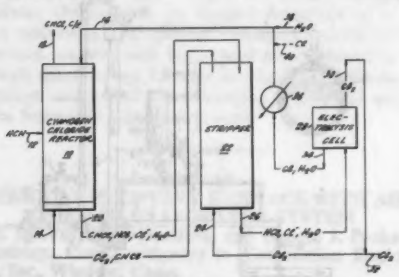
PROCESS FOR THE CONTINUOUS PRODUCTION OF CYANOGEN CHLORIDE

William S. Durrell and Robert J. Eckert, Jr., Mobile, Ala., assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Filed May 15, 1968, Ser. No. 729,239

Int. Cl. C01c *3/00*; C01b *7/08, 7/02*

U.S. Cl. 23—359 3 Claims



Cyanogen chloride is prepared in improved yield by a continuous process involving the electrolysis and recycle of hydrochloric acid formed as a by-product during the production of cyanogen chloride by reaction of hydrogen cyanide and chlorine gas. The recycle of chlorine formed in such electrolysis, as well as the hydrochloric acid-containing aqueous effluent therefrom, decreases the quantity of chlorine feed gas required for cyanogen chloride formation, manifestly improving the economics of such synthesis.

3,592,617

PRODUCING SMOKELESS-BRIQUETTES FROM BITUMINOUS COAL, SUB-BITUMINOUS COAL, OR LIGNITE

Sadrettin Alpan, Posta Caddesi 106/3, Cakaya, Ankara, Turkey, and Karl Alfred Jappelt, Hotel Berlin, Hisar Caddesi 7, Ulus, Ankara, Turkey

Filed May 12, 1969, Ser. No. 823,657

Claims priority, application Turkey, May 11, 1968, 25,740/5,929, Patent 14,873

Int. Cl. C10l *5/00*

U.S. Cl. 44—10H 5 Claims

A process for producing smokeless-briquettes from bituminous or sub-bituminous coal or lignite by hot-briquetting, comprising speedily drying the coal or lignite, preheating it to 340–420° C. without pressure, and finally heating it under pressure until the tar vapours have completely escaped.

3,592,618

ABRASIVE ARTICLE HAVING A METAL FILLER AND AN ACTIVE FILLER

Gardner E. Alden, Fayville, Mass., assignor to Avco Corporation, Cincinnati, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 523,523, Jan. 28, 1966. This application Mar. 10, 1969, Ser. No. 805,799

Int. Cl. C08g *51/12*; B24d *3/02*

U.S. Cl. 51—298 7 Claims

The invention covers an abrasive article which is constructed with two or more filled constituents that co-react to form a grinding aid. Generally, the fillers comprise a metal and a metal salt which upon the application of heat react to improve the grinding efficiency when compared with abrasive articles containing either of the two constituents that make up the novel filler combination. One of the preferred filler constituents is a reinforcing substance; the other is an active grinding aid.

3,592,619

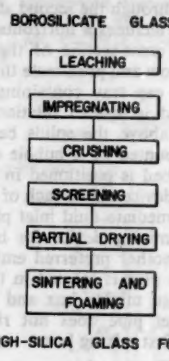
HIGH-SILICA GLASS FOAM METHOD

Thomas H. Elmer and Henry D. Middaugh, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 14, 1969, Ser. No. 815,897

Int. Cl. C03b *19/08, 33/00*

U.S. Cl. 65—22 9 Claims



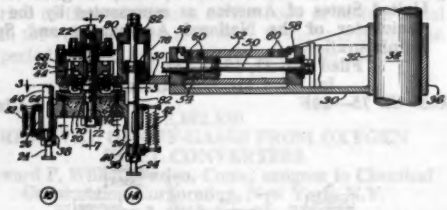
A method of making a high-silica glass foam by forming a body of borosilicate glass containing not more than about 70% by weight of silica, the glass being capable of separating into a silica-rich phase and a silica-poor phase, treating the glass with a mineral acid to remove the silica-poor phase and leave a high silica body having a porous structure, impregnating the porous body with a boric oxide solution, crushing and screening the porous body, drying the particulated material to remove excess

water, and sintering and foaming the particulated material to form a fused, a low expansion, high silicaglass foam.

3,592,620
METHOD OF HEAT SEALING THE OUTER LAYERS OF A GLASS LAMINATE
Anthony R. Carlisi, Elmira, Joseph J. Domicone, Horseheads, and Leon P. Pelletier, Schenectady, N.Y., assignors to Corning Glass Works, Corning, N.Y.
No Drawing. Filed Aug. 21, 1968, Ser. No. 754,479
Int. Cl. C03b *23/20*
U.S. Cl. 65—30 **4 Claims**

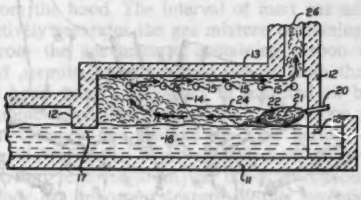
This invention relates to a method, and the product resulting therefrom, for closing the gap at the edge of a laminated structure, by flame heating the gap and introducing into the flame at least one compound thermally decomposable to at least one glass network forming oxide selected from the group consisting of SiO_2 and B_2O_3, so as to in combination lower the surface tension of the adhered glass layer and deposit a layer of glass having properties similar to that of the adhered layer; thereby sealing the edge gap and completely enveloping the core portion of the laminate.

3,592,621
VACUUM TAKE-OUT ASSEMBLY FOR GLASS MAKING APPARATUS
Kenneth R. Hileman, Anderson, Ind., assignor to Lynch Corporation, Anderson, Ind.
Filed Sept. 20, 1968, Ser. No. 761,108
Int. Cl. C03b *9/04*
U.S. Cl. 65—260 **6 Claims**



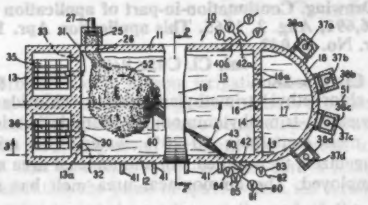
A take-out assembly for glassware forming machines having an oscillatable cross arm, each end of the cross arm carrying an engaging and supporting means for a molded article and operable to remove the molded article from a mold of a mold carrier member, oscillate 180°, and deposit the article on a take-away conveyor. By providing an engaging and supporting means for each end of the cross arm, in one take-out cycle one end of the arm is operable to remove a molded article from a mold while at the same time the other end is operable to deposit a molded article on the take-away conveyor. Fluid pressure operated means in the form a cylinder, piston therein, and a rack and pinion connection with a shaft for the cross arm, oscillates the cross arm with a shorter stroke and accordingly less momentum and inertia than the usual type of reciprocating take-out arrangement. Means is provided at the take-out station for lowering the molded article engaging and supporting member relative to the cross arm and into engagement with the molded article, and then lifting the article out of the mold. The article engaging and supporting members are of the vacuum type, automatic vacuum valves being provided to communicate a source of vacuum with the engaging and supporting means when engaged with the molded article and while lifting it and transferring it to the take-away conveyor whereupon the vacuum is released from the engaging and supporting means to permit the article to be deposited on the take-away conveyor.

3,592,622
OXY-FUEL ACCELERATED GLASS MELTING FURNACE AND METHOD OF OPERATION
Thomas L. Shepherd, Essex Fells, N.J., assignor to Air Reduction Company, Incorporated, New York, N.Y.
Filed June 5, 1968, Ser. No. 734,611
Int. Cl. C03b *5/04*
U.S. Cl. 65—135 **17 Claims**



This specification discloses a method and apparatus for raising the temperature of the glass in a glass-fining furnace without producing a corresponding increase in the temperature of the crown of the furnace. The improved result is obtained by using auxiliary heat from an oxy-fuel burner flame projected into the furnace as a non-luminous flame, having low radiation. The flame is projected in the direction of the greater length of the furnace and from a level above the glass and downward at an angle which permits the combustion of the burner flame to be substantially complete before the products of combustion of the flame jet brushes the top surface of the molten glass. Heat is transferred from the products of combustion to the glass mainly by convection.

3,592,623
GLASS MELTING FURNACE AND METHOD OF OPERATING IT
Thomas L. Shepherd, Essex Fells, N.J., assignor to Air Reduction Company, Incorporated, New York, N.Y.
Continuation-in-part of application Ser. No. 734,611, June 15, 1968. This application Apr. 4, 1969, Ser. No. 813,505
Int. Cl. C03b *5/04*
U.S. Cl. 65—135 **26 Claims**

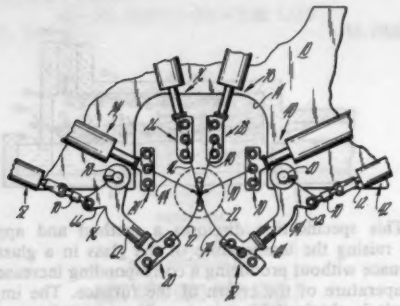


This invention relates to a method and apparatus for increasing the melting rate in a glass tank utilizing oxy-fuel combustion techniques. More particularly, an oxy-fuel flame is directed toward the feed end of a glass tank so as to control the location and melting of the raw glass batch materials that are added to the melting zone.

3,592,624
SCOOP OPERATING MECHANISM FOR A MOLTEN GLASS DELIVERY SYSTEM
Francis A. Dahms, Tariffville, Conn., assignor to Emhart Corporation, Bloomfield, Conn.
Filed Sept. 20, 1968, Ser. No. 761,258
Int. Cl. C03b *7/00*
U.S. Cl. 65—304 **4 Claims**

A plurality of scoop operating fluid motors are mounted in a semi-circular pattern atop a triple gob glassware forming machine for successively moving a plu-

rality of scoops from and to active positions beneath a triple gob feeder bowl. The machine is a six section Hartford I. S. machine, and has triple gob scoops associated with each section. Four of the six scoops are connected directly to the reciprocating parts of four of the fluid



motors, and the two end scoops are connected to one arm of a horizontally pivotable bellcrank mounted to the machine frame, the bellcrank having a second arm which is driven by one of the two endmost fluid motors through a short intermediate link, to move its associated scoop arcuately in a horizontal plane.

ERRATUM

For Class 65—334 see:
Patent No. 3,592,938

3,592,625
FERTILIZER

Willi Burkhart, Chur/Gross, and Kurt Hungerbuhler, Rieden, near Nussbaumen, Switzerland, assignors to Inventa A.G. fur Forschung und Patentverwertung Zurich

No Drawing. Continuation-in-part of application Ser. No. 476,691, Aug. 2, 1965. This application Apr. 13, 1970, Ser. No. 28,042

Int. Cl. C05c *9/00*

U.S. Cl. 71—28 **8 Claims**

(2-chloroethyl)-trimethylammonium chloride or (2-bromoethyl)-trimethylammonium bromide is added to a urea melt containing 10–20% water. The mixture is homogenized, then prilled. An ammoniacal urea melt may be employed. The ammoniacal urea melt has a pH of 8–11.

3,592,626
METHOD OF DESICCATING FOLIAGE OF A CROP

Basil Jason Heywood, Hornchurch, and William George Leeds, London, England, assignors to May & Baker Limited, Dagenham, Essex, England

No Drawing. Continuation-in-part of application Ser. No. 751,374, Aug. 9, 1968, which is a continuation-in-part of application Ser. No. 546,606, May 2, 1966, which in turn is a continuation-in-part of applications Ser. No. 309,398, Sept. 17, 1963, and Ser. No. 389,482, Aug. 14, 1964. This application Apr. 22, 1970, Ser. No. 30,997

Int. Cl. A01n *9/00*; C11c *3/00*

U.S. Cl. 71—70 **1 Claim**

3,5 - dibromo- and 3,5-diiodo - 4 - n-octanoyloxybenzonitriles are disclosed as herbicides. They are particularly useful for treatment of broad-leafed weeds in graminaceous crops, and for desiccating the foliage of potato, cotton, hop and leguminous seed crops. Enhanced activity compared with the parent hydroxybenzonitriles is described.

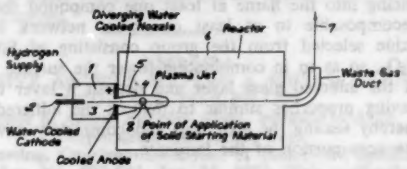
3,592,627
PRODUCTION OF PARTICULATE, NON-PYROPHORIC METALS

Ernst Neuenschwander, Basel, Switzerland, assignor to Hermann C. Starck Berlin, Berlin, Germany

Original application June 7, 1966, Ser. No. 555,859, now Patent No. 3,475,158, dated Oct. 28, 1969. Divided and this application Mar. 20, 1969, Ser. No. 832,518

Int. Cl. C22b *9/14*; C22d *5/00*; B22f *9/00*

U.S. Cl. 75—.5BB **1 Claim**



Rhenium powder having an average particle size from 0.005 to 0.03 micron, an oxygen content not exceeding 3 mg. per square meter of surface, and is non-pyrophoric is disclosed.

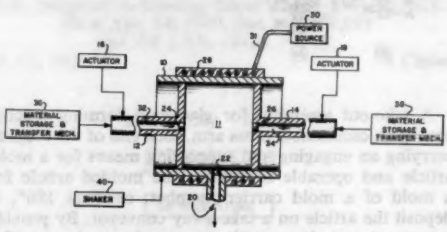
3,592,628
METHOD OF MAKING FOAMED MATERIALS IN ZERO GRAVITY

Hans F. Wuenscher, Huntsville, Ala., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 22, 1968, Ser. No. 769,665

Int. Cl. C21c *7/00*; C22c *1/08*

U.S. Cl. 75—20F **3 Claims**



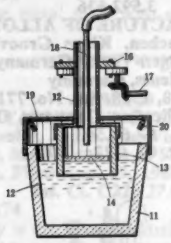
A method of making homogeneous foamed materials by mixing two or more materials having different physical properties in a zero-gravity environment. The materials are stored as liquids, gases and solids, the solid materials being in particles like powders and fibers. When making a homogeneous solid structure from two or more solid materials the solid materials are heated to change the state of one or more of the materials to a liquid for mixing. A foamed material can be made by decomposition of one material in a liquid or by injection of an inert gas into a liquid. Inert gas can also be injected into a homogeneous mixture of a liquid and solid particles. The mixture is then agitated so as to form a homogeneous mixture of solids in liquids or gases in liquids. Due to the absence of gravity forces, i.e., dead weight, it is possible to uniformly disperse solid particles or a gas within a liquid and there is no tendency to separate out since settling of the heavier materials is eliminated. Since there is no tendency to separate the mixture can be cooled at length to form a desired homogeneous material.

3,592,629

METHOD FOR REFINING MOLTEN METAL

Ryo Ando and Tutomu Fukushima, Yokohama-shi, Eiichi Hiraguchi, Hiroshima-ken, and Kokichi Hagiwara, Yokohama-shi, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed July 25, 1967, Ser. No. 655,921
Claims priority, application Japan, July 28, 1966, 41/49,179
Int. Cl. C21c *5/28, 7/02*
U.S. Cl. 75—58 7 Claims



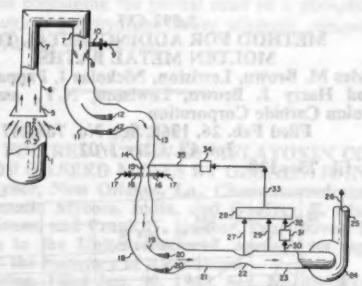
A method for refining a molten metal such as molten pig iron. The molten metal which contains impurities is poured into a vessel such as a suitable ladle. A purifying agent which reacts with the molten metal to eliminate at least part of the impurities thereof is added to the molten metal. Then the molten metal to which the purifying agent has been added is stirred only in the region of the surface of the molten metal. The adding of the purifying agent to the molten metal and the stirring thereof takes place after the molten metal has been poured into the vessel during a period of time when parts of the body of molten metal within the vessel are still in motion. In the case of pig iron this period of time has a duration of at least one hour.

3,592,630

REMOVAL OF OFF-GASES FROM OXYGEN STEEL CONVERTERS

Howard P. Willett, Darien, Conn., assignor to Chemical Construction Corporation, New York, N.Y.

Filed May 3, 1968, Ser. No. 726,332
Int. Cl. C21c *5/38*
U.S. Cl. 75—60 12 Claims



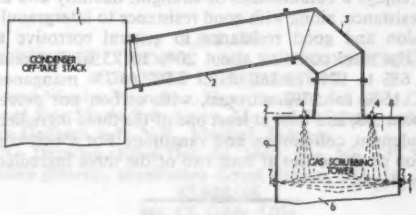
Off-gas is removed from an oxygen steel converter through an air-ventilated hood. Oxygen in the inducted air reacts within the hood with carbon monoxide in the off-gas, and the resulting hot gas mixture is quench-cooled, usually by direct contact with water. The flow rate of the dry gas component of the resulting cold gas mixture is measured and the mixture flow rate is regulated, to provide essentially constant dry gas flow rate during all intervals between and during the blow period and the magnitude of the flow rate is controlled at a level which provides an excess of air at the onset interval and termination interval of the blow period, and a deficiency of air at the peak of the blow period. The gas mixture removed from the hood at the onset and termination intervals of the blow period contains an excess of free oxygen, while the gas mixture removed at the peak of the blow period contains an excess of carbon monoxide. Between the periods of excess free oxygen content and excess carbon monoxide content, an inert gas mixture principally containing nitrogen and carbon dioxide is removed from the hood. The interval of inert gas mixture flow effectively separates the gas mixture containing free oxygen from the gas mixture containing carbon monoxide, and permits the removal of off-gas from the air-ventilated hood using a deficiency of inducted air below the stoichiometric requirement for the total carbon monoxide combustion at the peak of the blow period, while preventing the formation of an explosive gas mixture in the gas stream removed from the hood throughout the blow period. An important feature of this invention is the complete separation and lack of dependency of the steel making function on the gas collecting and cleaning function.

3,592,631

METHOD FOR TREATING ZINC BLAST FURNACE GASES

Claude Cattelain, Douai, France, assignor to Metallurgical Processes Limited, Nassau, Bahamas, and Imperial Smelting Corporation (N.S.C.) Limited, London, England, doing business as Metallurgical Development Company

Filed Apr. 11, 1968, Ser. No. 720,535
Claims priority, application Great Britain, Apr. 25, 1967, 19,004/67
Int. Cl. C22b *19/08*
U.S. Cl. 75—88 2 Claims



A dry crossover duct without irrigation means for conveying zinc blast furnace exit gases, connects a condenser with a scrubbing tower, the duct being sloped upwardly towards the scrubbing tower to return liquid metal to the condenser. The scrubbing tower includes sprays for cooling and saturating the gases in space within the scrubbing tower in order to avoid accretion at the end of the duct or tower.

ERRATUM

For Class 75—108 see:
Patent No. 3,592,939

3,592,632

HIGH TEMPERATURE NICKEL-CHROMIUM-IRON ALLOYS PARTICULARLY SUITABLE FOR STEAM POWER APPLICATIONS

Robert C. Gibson, Ringwood, N.J., and Glenn W. Tuffnell, Warwick, N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

No Drawing. Filed July 14, 1966, Ser. No. 565,083
Int. Cl. C22c *37/10, 39/02*
U.S. Cl. 75—124 11 Claims

A nickel-iron-chromium alloy containing molybdenum and/or tungsten and beneficially aluminum, titanium and

carbon, the constituents being so correlated as to provide highly useful properties which enable the alloy to be used for such applications as superheater tubes.

3,592,633
HIGH STRENGTH LOW ALLOY STEEL POSSESSING SUFFICIENT WELDABILITY CONTAINING SMALL AMOUNTS OF Nb, Ti, AND B

Tatsumi Osuka, Junichi Tanaka, Michio Hayashida, and Yoshiaki Ono, Kawasaki-shi, Japan, assignors to Nippon Kokan Kabushiki Kaisha

No Drawing. Filed Jan. 22, 1969, Ser. No. 802,715
Claims priority, application Japan, Jan. 22, 1968, 43/3,389
Int. Cl. C22c *37/10, 39/02*
U.S. Cl. 75—124 4 Claims

High-strength low-alloy steel keeping yield strength of more than 70 kg./mm.^{2} in a further coordinated relationship with specific small amounts of alloying ingredients, particularly Nb+Ti+B, and possessing good toughness and sufficient weldability through an ordinary quench-temper heat-treatment.

3,592,634
HIGH-STRENGTH CORROSION-RESISTANT STAINLESS STEEL

Elbert E. Denhard, Jr., Towson, Md., D Cameron Perry, Middletown, Ohio, and Robert R. Gaugh, Lutherville, Md., assignors to Armco Steel Corporation, Middletown, Ohio

No Drawing. Filed Apr. 30, 1968, Ser. No. 725,516
Int. Cl. C22c *39/20*
U.S. Cl. 75—128A 17 Claims

Chromium-nickel-manganese steel characterized by good welding properties, which steel in the as-welded condition enjoys a combination of strength, ductility and impact resistance, along with good resistance to intergranular corrosion and good resistance to general corrosive attack. The steel contains about 20% to 25% chromium, about 6% to 17% nickel, about 3.5% to 7% manganese, about .15% to .50% nitrogen, with carbon not exceeding about .08, and with at least one of the three ingredients molybdenum, columbium and vanadium. For a best combination of properties at least two of the three ingredients are employed.

3,592,635
HIGH-TEMPERATURE CORROSION-RESISTANT STEEL

Kunio Kusaka, Yokohama, Takasi Igari, Kawasaki, and Kunio Sueyoshi and Hiroshi Fujishiro, Hatano, Japan; said Sueyoshi and Fujishiro assignors to Nittan Valve Company, Ltd., Tokyo, Japan, and said Kusaka and Igari assignors to Tokushu Seiko Company, Ltd., Kawasaki, Japan

No Drawing. Filed Mar. 4, 1969, Ser. No. 804,271
Claims priority, application Japan, Sept. 11, 1968, 43/64,919
Int. Cl. C22c *39/20*
U.S. Cl. 75—128N 7 Claims

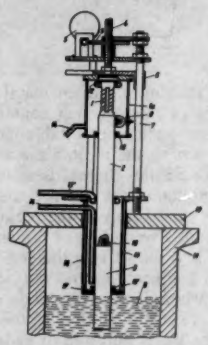
This patent relates to corrosion-resistant austenitic steels possessing improved mechanical and chemical resistance properties at high temperatures. The invention is more specially though not exclusively directed to such steels having improved corrosion-resistant characteristics in the presence of vanadium pentoxide and which will consequently be highly suitable for use in the construction of certain part of internal combustion engines, including especially the valves thereof, which are liable to be exposed to the combustion products of low grade residual fuels oils for the operation of present-day marine engines.

This invention disclosed that the above mentioned desirable results are obtained in certain chromium-containing austenitic steels by using composition that exhibit the following features: (1) The use of a carbon content within a restricted range of about 0.30 to 0.70%, (2) the use of silicon contents of 1.10 to 2.5%, (3) manganese of 5.0 to 12.0%, (4) nickel of 2.0 to 7.0%, (5) chromium of 18.0 to 25.0%, (6) nitrogen of 0.20 to 0.60%, (7) arsenic of 0.02 to 0.40%, (8) the use of boron in amounts up to 0.1%, (9) the use of sulfur in substantial amounts up to 0.1% all by weight, the balance being substantially iron with incidental impurities.

3,592,636
MANUFACTURE OF ALLOYS

Reimar Pohlman, Aachen, Klaus Groove, Neuss, and Walter Fichtl, Buttgen-Vorst, Germany, assignors to Groove & Welter, Neuss, Germany

Filed Oct. 28, 1968, Ser. No. 771,028
Claims priority, application Germany, Oct. 31, 1967, G 51,503
Int. Cl. C22c *1/00*
U.S. Cl. 75—135 9 Claims



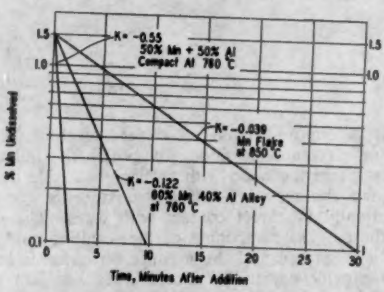
This invention relates to the introduction of a controlled quantity of a high melting component into a melt of a low melting base metal. This is effected by feeding a rod of the high melting component into the above melt, while the said rod is subjected to a sonic vibration, and at the same time, that portion of the rod protruding above the level of the melt is cooled.

This melt ensures that the manufacture of alloys is effected with great accuracy, simplicity and economy.

3,592,637
METHOD FOR ADDING METAL TO MOLTEN METAL BATHS

Charles M. Brown, Lewiston, Nicholas J. Pappas, Snyder, and Harry J. Brown, Lewiston, N.Y., assignors to Union Carbide Corporation

Filed Feb. 26, 1968, Ser. No. 708,267
Int. Cl. C22c *1/02*
U.S. Cl. 75—138 11 Claims



A method of addition of a metal to a molten metal bath by mixing the aluminum to be dissolved in finely

divided form with a solution promoting aluminum, also in finely divided form, and adding the mixture to molten metal.

3,592,638
ALLOY
William R. Freeman, Jr., Easton, Conn., assignor to Avco Corporation, Stratford, Conn.
No Drawing. Filed Aug. 22, 1969, Ser. No. 852,499
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 11 Claims

A cobalt-base metal alloy with superior high temperature properties.

3,592,639
TANTALUM-TUNGSTEN ALLOY
Mortimer Schussler, Joppa, and Victor T. Bates, Millersville, Md., assignors to Fansteel Inc.
No Drawing. Filed Aug. 19, 1968, Ser. No. 753,721
Int. Cl. C22c *27/00*
U.S. Cl. 75—174 5 Claims

A novel alloy is disclosed consisting essentially of from 1.5 to 3.5 weight percent of tungsten, the balance of the alloy being essentially tantalum. Optionally, the alloy contains from 0.05 to 0.5 weight percent of columbium. These alloys have improved strength when compared with pure tantalum, yet they are cold workable in conventional equipment for cold-working tantalum, unlike the known tantalum-tungsten alloys having higher concentrations of tungsten. Also, the alloys disclosed herein show improved corrosion resistance over pure tantalum and the known tantalum-tungsten alloys having a higher tungsten concentration.

3,592,640
PROCESS FOR PREPARING A PLANOGRAPHIC PRINTING MASTER
Jozef Leonard Van Engeland, Saint Katelijnewaver, Noel Jozef De Volder, Edegem, and Jozef Frans Willems, Wilrijk, Belgium, assignors to Gevaert-Agfa N.V.
No Drawing. Filed Mar. 6, 1968, Ser. No. 710,730
Claims priority, application Great Britain, Mar. 6, 1967, 10,477/67
Int. Cl. G03f *7/02*; G03g *13/00*
U.S. Cl. 96—1 7 Claims

A planographic printing plate obtaining by xerographic exposure and development is hydrophilized with an aqueous solution containing the partial ester of a phosphorus oxy acid with a polyhydroxy lower aliphatic compound or a polyhydroxy cyclohexane.

3,592,641
PROCESS FOR REDUCTION OF AFLATOXIN CONTENT OF OILSEED MEALS BY OZONIZATION
Eric T. Rayner, New Orleans, La., Channasamudram T. Dwarakanath, Mysore, India, and Godfrey E. Mann, New Orleans, and Frank G. Dollear, Pearl River, La., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed Jan. 30, 1969, Ser. No. 795,331
Int. Cl. A23k *1/00*
U.S. Cl. 99—2 3 Claims

This invention relates to a process for lowering the aflatoxin level in peanut and cottonseed meals contaminated with aflatoxin. Contaminated cottonseed and peanut meals hydrated to a level of 22% and 30% respectively were contacted with ozone gas in a covered vessel at atmospheric pressure and heated to temperatures about from 75° C. to 100° C. for periods of about from 60 to 120 minutes to achieve substantial lowering of the aflatoxin content.

3,592,642
DUPLICATING METHOD WHEREIN A PAPER SHEET HEATED TO THE MELTING POINT OF A TONER IMAGE SIMULTANEOUSLY CAUSES THE TRANSFER OF THE TONER FROM THE PHOTOCONDUCTOR AND FUSING OF THE TONER IMAGE ON THE PAPER SHEET
Norbett H. Kaupp, Newark, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Nov. 21, 1966, Ser. No. 595,752
Int. Cl. G03g *13/14*
U.S. Cl. 96—1.4 2 Claims

This invention deals with the simultaneous transfer and fusing of a toner image from a photoconductive layer to an ordinary paper sheet which is heated to the fusion temperature of the toner but below the charring temperature of the paper and brought into contact with the photoconductive layer and removed to transfer the toner image.

3,592,643
PHOTOCONDUCTIVE CADMIUM SULFIDE COMPOSITION AND PROCESS OF PREPARING
John J. Bartfai, Schenectady, N.Y., assignor to General Electric Company
No Drawing. Filed Aug. 15, 1968, Ser. No. 752,751
Int. Cl. G03g *5/00*
U.S. Cl. 96—1.5 12 Claims

A photoconductive polymer composition and process of preparing is described in which the composition is comprised of a substantially non-photoconductive polymer having dispersed therein photoconductive precipitated cadmium sulfide particles no greater than about ½ micron, the surfaces of said cadmium sulfide particles being pre-coated with a dispersing agent.

3,592,644
THERMORECORDING AND REPRODUCTION OF GRAPHIC INFORMATION
Marcel Nicolas Vrancken, Hove, and Daniel Alois Claeys and Eric Maria Brinckman, Mortsel, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium
No Drawing. Filed Oct. 24, 1967, Ser. No. 677,751
Claims priority, application Great Britain, Oct. 24, 1966, 47,628/66
Int. Cl. G03c *5/04*
U.S. Cl. 96—27 22 Claims

A recording layer of finely divided thermoplastic particles is imagewise heated to water-impermeability and a meltable material like a wax which melts below the temperature of water-impermeability of the thermoplastic particles and is either carried in the thermoplastic particle layer or in a layer under it is heated to melting and diffuses through the unheated areas of the thermoplastic particle layer to a receiving support.

3,592,645
COLOR PRINTS OF IMPROVED BRIGHTNESS
Walter J. Weyerts and Gladys L. MacIntyre, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Aug. 30, 1967, Ser. No. 664,257
Int. Cl. G03c *5/54*, *1/60*
U.S. Cl. 96—29D 16 Claims

Color prints having increased brightness and with whiter print borders are produced by the inclusion of an optical brightening agent in the image receiving element of a dye developer diffusion transfer system. The brightener is placed intermediate a support layer and a dye-mordant layer in the image reception element.

3,592,646

DIAZO COMPOUNDS AND PHOTOGRAPHIC ELEMENTS

Colin Holstead, Abbotts Langley, England, and Wojciech Maria Prezezdziecki, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 20, 1968, Ser. No. 714,415
Claims priority, application Great Britain, Mar. 31, 1967, 14,953/67
Int. Cl. G03f 7/08; G03c 1/54
U.S. Cl. 96—33 19 Claims

A light-sensitive 1,2-diazo ketone trihalomethane compound is employed in photographic elements with or without gelatin or an alkali-insoluble polymer wherein both positive or negative images are obtained with utility in photomechanical reproductions and photoresist applications.

3,592,647

PROCESS FOR IMPROVING PLANOGRAPHIC OFFSET PRINTING PLATES

Ralph Kingsley Blake, Westfield, N.J., and Michael P. Dunkle, Towanda, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 7, 1967, Ser. No. 644,092
Int. Cl. G03f 7/02
U.S. Cl. 96—33 8 Claims

A process of image reproduction which comprises: (a) image-wise exposing a silver halide emulsion on a support; (b) forming a metallic silver surface image in the unexposed areas by silver transfer development; (c) treating the surface of the element with a solution of an adjuvant which renders the unexposed areas more oleophobic than the exposed areas; and (d) using the element to print by lithography.

3,592,648

DYE TRANSFER PROCESS FOR FORMING MOTION PICTURE SOUND TRACK

Juergen H. H. Keller and Robert H. Sprague, Chelmsford, Mass., assignors to Itek Corporation, Lexington, Mass.

No Drawing. Filed Apr. 4, 1969, Ser. No. 813,759
Int. Cl. G03c 5/14
U.S. Cl. 96—39 3 Claims

A light-absorptive image is placed on a record surface, such as a sound track on film, by forming a hardened gelatin or similar absorptive image, imbibing a dye into the image, transferring the dye to the record surface and fixing or mordanting the dye therein. The dye, normally highly unstable, is unexpectedly light stable in its mordanted form, and absorbs radiation in the range from about 650 to 1000 mm. Suitable dyes are certain cyanine dyes.

3,592,649

COLOR PHOTOGRAPHIC PROCESS FOR PRODUCING VISUALLY TRANSPARENT BUT PHOTOGRAPHICALLY OPAQUE PHOTOMASKS

Harry N. Parsonage and Melvyn I. Kruger, Dayton, Ohio, assignors to The Mead Corporation, Dayton, Ohio

No Drawing. Filed Apr. 21, 1967, Ser. No. 632,568
Int. Cl. G03c 5/00, 7/00
U.S. Cl. 96—36 22 Claims

Photomasks and a process for producing the same which comprises prehardening a high resolution photographic plate containing a latent photographic image in a prehardening bath, developing the plate in a developer containing a magenta and a yellow dye coupler and appropriate developing agents and then bleaching and stabilizing the resultant plate. A photomask is obtained containing a dye image in place of the normal opaque background. It is useful in photomechanical reproduction, particularly with positive photoresists in the production of semiconductive devices, and especially where multiple registering and printing operations are required.

3,592,650

LIGHT AND HEAT SENSITIVE SYSTEM COMPRISING A LEUCO BASE OF A DIALKYLAMINO POLYARYLMETHANE DYE QUATERNIZED TO THE MAXIMUM EXTENT

Roy C. De Selms, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Aug. 1, 1969, Ser. No. 846,964
Int. Cl. G01n 21/34; G03c 5/24
U.S. Cl. 96—48 22 Claims

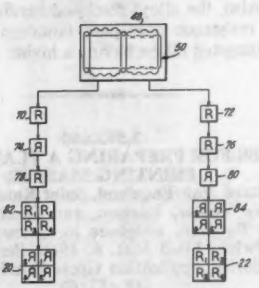
The leuco base of a polyarylmethane dye, such as crystal violet or malachite green, which has been quaternized to the maximum extent with an alkyl iodide, such as methyl iodide, is a radiation-sensitive material which is useful in the preparation of images by thermographic and photothermographic processes. Images in a variety of colors can be prepared from elements containing this material by imagewise exposure to heat or by imagewise exposure to ultraviolet radiation or halogen vapor, preceded or followed by uniform exposure to heat.

3,592,651

METHOD FOR MAKING DIES

Carl John Klemm, Appleton, Wis., and Richard August Tietz, Streamwood, Ill., assignors to American Can Company, New York, N.Y.

Filed Nov. 12, 1968, Ser. No. 774,716
Int. Cl. G03c 5/00
U.S. Cl. 96—36 3 Claims



A die for cutting paperboard material or the like comprises a pair of die plates having coacting cutting elements which partially overlap in the plane of the material to be cut. In making the die plates, two separate images representing the male and female cutting elements are separately stepped and repeated onto two separate sheets of film to provide multiple, like images thereon. One of the separate images is stepped and repeated through the base of the raw film on which the multiple, like images are imposed whereby each step and repeat operation onto the two separate sheets of film are effected in the same sequential order leading toward production of a pair of matched, coacting die plates.

3,592,652

PHOTOGRAPHIC SILVER HALIDE DEVELOPER COMPOSITIONS AND NOVEL DEVELOPING AGENTS

Charleton C. Bard, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 639,274, May 18, 1967. This application Feb. 20, 1969, Ser. No. 801,138
Int. Cl. G03c 5/30, 7/00
U.S. Cl. 96—55 13 Claims

Monocylic and bicyclic phenols containing at least one sulfonamido group, especially an aromatic sulfonamido group, and a nitrogen containing radical (which may be a

sulfonamido group), are described. They are photographic silver halide developing agents for black-and-white development, but are especially useful as competing or balancing developing agents in photographic color developers to control amount of dye produced by the color developer, especially those containing the color-former or coupler.

3,592,653
SILVER HALIDE EMULSIONS CONTAINING PYRROLE CYANINE DYES

Arthur Fumia, Jr., Hilton, and Donald W. Heseltine, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 5, 1967, Ser. No. 673,001
Int. Cl. G03c *1/10, 1/36*
U.S. Cl. 96—101 **29 Claims**

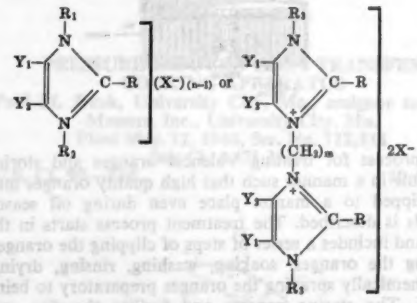
Novel cyanine dyes which feature a pyrrole nucleus linked, by the 2-carbon atom thereof, to the methane chain of the dye, are useful sensitizers in photographic silver halide emulsions.

3,592,654
SUPER-SENSITIZED PHOTOGRAPHIC SILVER HALIDE EMULSIONS

Yoshiyuki Nakazawa, Masao Sawahara, and Masanao Hinata, Minami-Ashigara Machi, Ashigara-Kamigun, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Aug. 16, 1967, Ser. No. 660,907
Claims priority, application Japan, Aug. 17, 1966, 41/54,086
Int. Cl. G03c *1/28*
U.S. Cl. 96—126 **12 Claims**

Sensitivity is increased markedly without accompanying increased fog formation by super-sensitizing a photographic silver halide emulsion containing a sensitizing cyanine dye with a quaternary salt of imidazole shown by the general formula:



wherein R is H, an alkyl group, or a hydroxyalkyl group, each of R_1 and R_2 is an alkyl, aralkyl, hydroxyalkyl, acetoxyalkyl, aryl, or alkenyl group, X is an anion, each of Y_1 and Y_2 is H, an alkyl group or a halogen atom.

3,592,655
PHOTOGRAPHIC EMULSIONS AND ELEMENTS COMPRISING A POLYMER OF A DISULFONATE COMPOUND

Thomas K. Dykstra, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 28, 1968, Ser. No. 716,995
Int. Cl. G03c *1/04*
U.S. Cl. 96—114 **17 Claims**

Novel polymerizable disulfoalkyl esters of dicarboxylic acids and polymers thereof and their use in photographic compositions are disclosed.

3,592,656
PHOTOGRAPHIC SILVER HALIDE MATERIALS SUPERSENSITIZED WITH A COMBINATION OF A TRIAZOLE AND A CYANINE DYE

Dugald A. Brooks, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Sept. 3, 1968, Ser. No. 757,147
Int. Cl. G03c *1/28*
U.S. Cl. 96—126 **6 Claims**

Photographic silver halide emulsions are supersensitized with the combination of a photographic spectral sensitizing methine dye and a heterocyclic compound selected from a pyrazole, a 5-pyrazolone, a 3-pyrazolone, a 3,5-pyrazolidinedione, a triazole, a tetrazole, a xanthine, an imidazole, an imidazolidine and an imidazolinium salt.

3,592,657
OPTICALLY SENSITIZED SILVER HALIDE LIGHT-SENSITIVE MATERIAL

Helmut Kampfer, Cologne-Stammheim, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 9, 1968, Ser. No. 696,510
Claims priority, application Germany, Jan. 17, 1967, A 54,635
Int. Cl. G03c *1/08*
U.S. Cl. 96—142 **5 Claims**

The present invention relates to light-sensitive photographic layers, especially silver halide emulsion layers, spectrally sensitized with pentamethine cyanine sensitizing dyes in which the methine chain contains a squaric acid ring.

ERRATUM

For Class 99—2 see:
Patent No. 3,592,641

3,592,658
PROCESS FOR PREPARING STERILIZED COMMINUTED BEEF PRODUCTS

Gary W. Shults, Milford, Mass., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Aug. 1, 1968, Ser. No. 749,297
Int. Cl. A23b *1/00*; B65b *55/02*
U.S. Cl. 99—157 **5 Claims**

A cooked, comminuted beef pattie sterilized by ionizing radiation containing as additives corn starch, caseinate and salt.

3,592,659
METHOD OF AGGLOMERATING FROZEN PARTICLES

John W. Clancy, Shrub Oak, and Reuben H. Waltman, Pearl River, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

No Drawing. Filed Mar. 19, 1969, Ser. No. 808,667
Int. Cl. A23f *1/08*
U.S. Cl. 99—71 **5 Claims**

A method of agglomerating surface-meltable particles has been discovered. The method is particularly useful as a means of processing fines created when extracts are frozen and ground either for packaging in the frozen state or preparatory to freeze drying. The surface-meltable particles are allowed to fall freely past a compressed air nozzle which is used to direct a turbulent, expanding stream of warm air at the particles. The hot air causes a surface thawing and the particles stick to each other in the form of tacky agglomerates. The air stream is also used to blow

the particles into a cold atmosphere within which they instantly resolidify, thus binding together the agglomerates.

3,592,660
METHOD AND COMPOSITION FOR CONDITIONING BREAD DOUGH
Gerald D. Neu, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 719,253, Apr. 5, 1968. This application May 6, 1970, Ser. No. 35,229
Int. Cl. A21d *2/14, 2/16*
U.S. Cl. 99—91 9 Claims

A hydrate of a calcium salt of at least one C_{14}–C_{20} fatty acid, a monoglyceride and water is incorporated in bread dough for its dough conditioning effect. An amount providing calcium salt between 0.1 and 10 ounces per 100 pounds of flour is effective, but best results are secured with between 0.5 and 8 ounces per 100 pounds of flour. The hydrate can be added either to the sponge or the dough in a sponge-dough process. In a continuous process the hydrate can be added to the brew.

3,592,661
MARGARINE OILS CONTAINING INTERMEDIATE MELTING RANDOMLY ESTERIFIED TRIGLYCERIDES OF HIGH C_{12} CONTENT
Paul Seiden, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Sept. 16, 1968, Ser. No. 760,061
Int. Cl. A23d *3/00*
U.S. Cl. 99—122 4 Claims

Margarine oils comprising a soft oil component and an intermediate melting, randomly esterified, triglyceride component of high C_{12} content and low C_{16-18} content exhibit improved solids content properties as shown by a bent and rapidly sloping SCI curve.

3,592,662
PROCESS FOR TREATING A COMMINUTED PEANUT SLURRY
Chester M. Gooding, Westfield, N.J., assignor to CPC International Inc.
No Drawing. Filed Dec. 1, 1967, Ser. No. 687,155
Int. Cl. A23l *1/36*
U.S. Cl. 99—126 19 Claims

This process removes an alkaline malodorous distillate from a comminuted peanut slurry by passing the slurry in a thin film over a heated surface, under vacuum, while continuously agitating the film of slurry, to expose fresh portions of the slurry, and to improve heat exchange.

Peanut butter treated by the process, or prepared from a comminuted peanut slurry treated by the process, is characterized by an exceptionally fine flavor, excellent shelf life, and an absence of any unpleasant odor.

3,592,663
FLUFFY FROSTING COMPOSITIONS
Gordon F. Brunner and Benjamin Lawrence, Springfield Township, Hamilton County, Norman B. Howard, Hamilton, and Paul Seiden, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Mar. 11, 1968, Ser. No. 711,862
Int. Cl. A23g *3/00*
U.S. Cl. 99—139 13 Claims

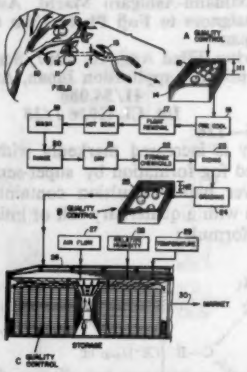
Fluffy frosting compositions (in the form of a dry mix or finished product) based on certain fatty acid esters of polyglycerol where a specified minimum amount of the fatty acid contains at least 22 carbon atoms.

ERRATUM
For Class 99—148 see:
Patent No. 3,592,940

3,592,664
PROCESS FOR TREATING FRUIT SECTIONS
Murray Verlin, 1312 Collins Ave., Lakeland, Fla. 33803
No Drawing. Filed Feb. 28, 1968, Ser. No. 708,796
Int. Cl. A23b *7/00*
U.S. Cl. 99—154 4 Claims

"Natural tasting" fruit sections are obtained by immersing in a sweetening solution within a container, sealing under steam to effect a certain range of vacuum, and heating to effect a low pressure under very controlled conditions of time and temperature.

3,592,665
VALENCIA ORANGE TREATMENT AND STORAGE SYSTEM
John R. MacRill, Ontario, Calif., and Malcolm H. Ellis, Yuma, Ariz., assignors to DVR Corporation
Filed Feb. 4, 1969, Ser. No. 796,408
Int. Cl. A23b *7/00, 7/16*
U.S. Cl. 99—154 3 Claims



A process for treating Valencia oranges and storing the same in a manner such that high quality oranges may be shipped to a market place even during off season periods is described. The treatment process starts in the field and includes a series of steps of clipping the oranges, floating the oranges, soaking, washing, rinsing, drying, and chemically spraying the oranges preparatory to being stored. The storing process and facility therefor constitute placing of the oranges in an enclosure for a period of from one to eight months while maintaining within close tolerances a proper air circulation, relative humidity, and air temperature.

3,592,666
PROCESS FOR AVOIDING SPLITTING OF VEGETABLES DURING FREEZING
Paul Wayne Butler, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Feb. 10, 1969, Ser. No. 798,114
Int. Cl. A23b *1/06, 7/100*
U.S. Cl. 99—193 3 Claims

In a process for freezing vegetables which are susceptible to surface splitting or cracking and/or whitening when frozen or while being frozen by a process which employs a liquid polyfluorinated halohydrocarbon having a normal boiling point of about −5° to −50° C. (23° to −58° F.)

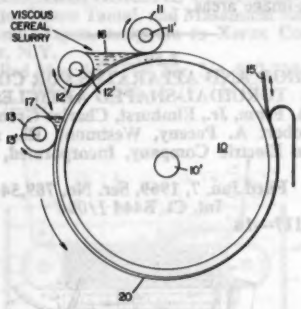
and a liquid density sufficient to float said vegetables, the improvement which comprises heating the vegetable throughout its mass to a temperature of 80°–100° C. (176°–212° F.) immediately prior to freezing.

3,592,667

CEREAL SLURRY DRYING

Vincent J. Kelly and William G. Fry, Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Filed June 3, 1968, Ser. No. 733,842
Int. Cl. A23b 7/02, 9/00
U.S. Cl. 99—199 3 Claims



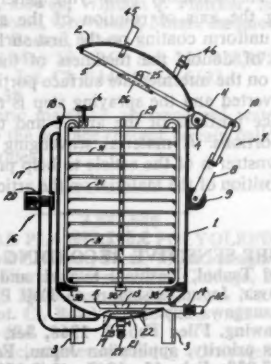
A process for preparing a continuous, uniform dried cereal sheet from a viscous cereal slurry by utilizing a series of rotatably-driven applicator rolls to distribute a corresponding number of incremental layers of slurry into intimate contact with the surface of a rotatably-driven drum drier at spaced-apart locations along a quadrant of the drier. The rolls are arranged along an upper quadrant of the drier surface so that at least one trough is provided for retention of slurry in contact with the drier surface and an applicator roll.

3,592,668

PRESSURE INDUCED HEAT TRANSFER COOKING APPARATUS

Paul M. Denk, University City, Mo., assignor to Food Masters, Inc., University City, Mo.

Filed Mar. 11, 1968, Ser. No. 712,211
Int. Cl. A47j 36/00
U.S. Cl. 99—234 10 Claims



In an apparatus for cooking foods, particularly meats, poultry, and fish, a pressure vessel is provided with attachments allowing for the selective conveyance of the elements of heat, pressure, and a coolant into the vessel, with a conduit also providing for the timely discharge of any of the foregoing. The apparatus incorporates means for inducing a circulation of the heat energy enclosed therein so that uniformity of temperature is maintained. Hydraulic or pneumatic lift means is provided for elevating or sealing the closure upon the vessel, and a removable retainer is supported within the interior of the apparatus to accommodate and support a quantity of food during the cooking process.

The process for cooking foods essentially comprises subjecting the enclosed foods to a quantity of thermal energy, introducing gaseous pressure to induce transfer of the heat into the interior of the foods thereby accelerating the cooking operation, while simultaneously circulating the heat energy, cooling the cooked foods and discharging the heat and pressure.

3,592,669

WATER REPELLENT COMPOSITION FOR COATED OPTICAL GLASS SURFACES

Hayward R. Baker, Silver Spring, Md., and Robert N. Bolster, Fairfax County, Va., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Apr. 23, 1968, Ser. No. 723,616
Int. Cl. C09k 3/18
U.S. Cl. 106—2 3 Claims

Compositions which are mixtures of a hydrocarbon wax in equal to minor proportion by weight with mixed isomers of long chain alkylamine salts of long chain alkyl or alkenylsuccinic acid long chain alkylmonoamides. The compositions are water repellent and may be used to provide a transparent water repellent film on optical glass surfaces which are coated with an antireflection coating such as magnesium fluoride.

3,592,670

GYPSUM SLURRY SET ACCELERATION METHOD

Donald A. Kossuth, Buffalo, and Daniel A. Winkowski and John W. Klems, Tonawanda, N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

No Drawing. Filed Feb. 3, 1969, Ser. No. 796,210
Int. Cl. C04b 11/14, 11/16
U.S. Cl. 106—110 8 Claims

A method of accelerating the setting time of a calcined gypsum slurry during the manufacture of a gypsum product such as wallboard or the like comprising the use of an aqueous suspension of freshly hydrated, fine, calcium sulfate dihydrate crystals and a saturated calcium sulfate dihydrate solution, said saturated calcium sulfate dihydrate solution comprising a major percentage by volume of the total water content of the calcined gypsum slurry from which the said gypsum product is made.

3,592,671

STABILIZATION OF CELLULOSE ESTER DOPES

Carl J. Malm and Walker F. Hunter, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation of application Ser. No. 725,958, May 1, 1968, which is a continuation of application Ser. No. 639,257, May 18, 1967, which in turn is a continuation-in-part of application Ser. No. 407,914, Oct. 30, 1964. This application Dec. 22, 1969, Ser. No. 882,786
Int. Cl. C08b 21/04, 21/06
U.S. Cl. 106—176 10 Claims

The use of a small amount of 1,2-propylene oxide in cellulose ester dopes has been found to result in the stabilization of such dopes to a significant degree against the formation of amber or brownish-red insoluble globules in the dope.

3,592,672

DRY STABILIZED, REWETTABLE SEMIPERMEABLE CELLULOSE ESTER AND ETHER MEMBRANES AND THEIR PREPARATION

Martin E. Rowley, Hilton, and Walter D. Slowig, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 726,550, May 3, 1968. This application Dec. 22, 1969, Ser. No. 887,313

Int. Cl. B29d *27/04*; C08b *27/42*; C08h *17/34*

U.S. Cl. 106—189 27 Claims

Membranes specially adapted to preferentially permit the passage of relatively pure water through them, while resisting the passage of dissolved salts must conventionally be kept water-wet in order to retain this ability to exclude salts. Dry, rewettable, stabilized membranes in which this desirable property is preserved, can be made by treating the wet membrane first with a water-miscible solvent, then with a non-polar organic solvent and finally drying the membrane. The presence of a water-soluble polyol in the dry membrane results in still better properties.

3,592,673

PROCESS FOR MAKING CERAMIC COLORING MATERIALS

Erich Ruf, Essen, Germany, assignor to Th. Goldschmidt A.G., Essen, Germany

No Drawing. Filed Jan. 16, 1968, Ser. No. 698,161

Int. Cl. C08h *17/04*; C09c *1/00*

U.S. Cl. 106—288B 5 Claims

This invention relates to a process for preparing tin-containing ceramic coloring material, which process comprises calcining, at a temperature of about 800 to 1400° C., a mixture of stannous oxide and a tungsten-containing or molybdenum-containing compound.

3,592,674

METHOD OF PREPARING A CALCIUM CARBONATE-MAGNESIUM HYDROXIDE PIGMENT AND THE PIGMENT PRODUCED

John Maskal and Ivan M. Thompson, Ludington, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Nov. 4, 1968, Ser. No. 773,340

Int. Cl. C09c *1/02*

U.S. Cl. 106—306 5 Claims

This specification discloses a method of preparing a pigment for use, for example, on paper surfaces comprising: calcining a dolomitic limestone to the oxides of magnesium and calcium, slaking at least the calcium oxide component in water to the corresponding hydroxide, carbonating only the calcium portion thereof to the carbonate, slaking any remaining magnesium oxide in water to the corresponding hydroxide, dewatering the resulting slurry, and if desired, washing and homogenizing the calcium carbonate and magnesium hydroxide mixture, to produce a micron sized pigment product useful in a number of applications.

3,592,675

METHOD FOR DEVELOPING LATENT ELECTROSTATIC IMAGES

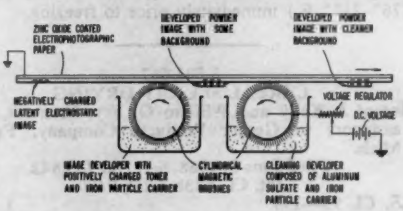
Tung-Nan Cheng, Bloomfield, N.J., assignor to Azoplate Corporation, Murray Hill, N.J.

Filed Oct. 9, 1967, Ser. No. 673,600

Int. Cl. G03g *13/08*

U.S. Cl. 117—17.5 11 Claims

This invention relates to a method for developing an electrostatic latent image on an image support which comprises contacting the image with a fusible resin powder to develop the image areas and then contacting the image and support with a mixture of effective amounts of finely divided iron carrier particles and a powder which removes undesired fusible resin particles from the non-image areas


ZINC OXIDE COATED ELECTROPHOTOGRAPHIC PAPER
DEVELOPED POWDER IMAGE WITH SOME BACKGROUND
DEVELOPED POWDER IMAGE WITH CLEANER BACKGROUND
NEGATIVELY CHARGED LATENT ELECTROSTATIC IMAGE
VOLTAGE REGULATOR
D.C. VOLTAGE
IMAGE DEVELOPER WITH POSITIVELY CHARGED TONER AND IRON PARTICLE CARRIER
CYLINDRICAL MAGNETIC BRUSHES
CLEANING DEVELOPER COMPOSED OF ALUMINUM SULFATE AND IRON PARTICLE CARRIER

of the support, thereby producing a developed image with clean non-image areas.

3,592,676

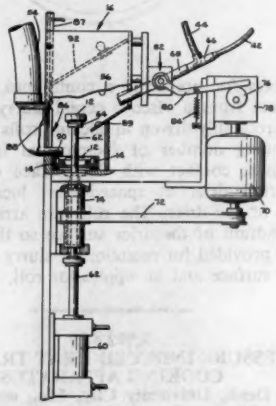
METHOD AND APPARATUS FOR COATING TOROIDAL-SHAPED ARTICLES

Charles A. From, Jr., Elmhurst, Charles Grenko, Berwyn, and Robert A. Peceny, Westmont, Ill., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 7, 1969, Ser. No. 789,544

Int. Cl. B44d *1/094*

U.S. Cl. 117—18 7 Claims



As a heated cylindrically-shaped article is rotated continuously about its cylindrical axis, a gaseous suspension of solid particulate material is sprayed at first surface portions and circular intermediate surface portions of the article in an oscillatory path lying generally in a plane containing the axis of rotation of the article, so as to deposit a uniform coating on the first surface portions on the order of double the thickness of the coating being deposited on the intermediate surface portions. The article then is inverted and the spraying step is repeated on second surface portions of the article and the intermediate surface portions. A material scavenging system is provided downstream of the article to help preclude non-uniform deposition of the material on the article.

3,592,677

PRESSURE SENSITIVE RECORDING MATERIALS

Masayoshi Tsuboi, Yoshiaki Suzuki, and Fumiko Kato, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Feb. 7, 1968, Ser. No. 703,522

Claims priority, application Japan, Feb. 7, 1967, 42/7,829; Feb. 13, 1967, 42/9,156, 42/9,157; Feb. 17, 1967, 42/10,229

Int. Cl. B41m *5/22*

U.S. Cl. 117—36.2 15 Claims

A pressure sensitive recording system comprising two supported layers, one of which layers contains an organo-

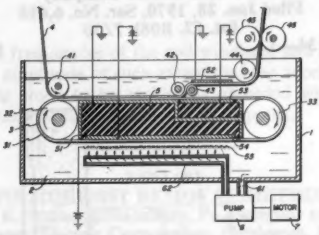
vanadium compound and the other of which layers contains an aromatic hydroxy compound capable of a color-forming reaction with the organo-vanadium compound, at least one of said compounds being present in the form of a solution encapsulated in pressure-rupturable microcapsules. The organo-vanadium compounds employed comprise the reaction product of an inorganic vanadium compound with particular nitrogen-containing compounds characterized by the presence of a hydrocarbon group having 6 to 21 carbon atoms.

3,592,678

LIQUID DONOR DEVELOPMENT WITH ELECTROPHORETIC CLEANING

Satoru Honjo, Yasuo Tamai, and Masamichi Sato, Asakashi, Saitama, Japan, assignors to Xerox Corporation, Rochester, N.Y.

Filed Mar. 14, 1969, Ser. No. 807,235
Int. Cl. G03g *13/10, 15/10*
U.S. Cl. 117—37 **10 Claims**



An electrostatographic imaging member bearing an electrostatic latent image on a recording surface is brought into contact with a toner layer on the surface of a donor member in a liquid developer bath, separated slightly from the donor member and thereafter subjected to an electric field which causes toner particles in the background areas of the recording surface as well as toner particles suspended in the space between the recording surface and the donor member to electrophoretically migrate to the donor member. The developed image on the recording surface passes through the zone subjected to the electric field to further clean the recording surface. Subsequently a uniform layer of toner is electrophoretically deposited on the donor.

3,592,679

SURFACE TREATMENT OF POLYMERIC MATERIALS

Paul R. Tully, Lowell, William J. Fletcher, Saugus, and Hector Cochrane, Groveland, Mass., assignors to Cabot Corporation, Boston, Mass.

Filed May 29, 1969, Ser. No. 828,972
Int. Cl. B44d *5/02, 5/03*
U.S. Cl. 117—38 **15 Claims**

Said polymeric materials are rendered water-repellent by applying to the surface thereof certain colloidal metal or metalloid oxides.

3,592,680

METAL PLATING OF POLYOLEFINS

Raymond P. Bayer, Pierz, Minn., assignor to Borg-Warner Corporation, Chicago, Ill.

No Drawing. Filed Aug. 29, 1968, Ser. No. 756,306
Int. Cl. B44d *1/092;* **C23c** *3/02*
U.S. Cl. 117—47A **10 Claims**

A method of electrolessly plating a polyolefin substrate with copper, nickel or cobalt prior to application of an electrolytically deposited metal. A surface treatment step, which includes the application of an organophosphorus compound, is effective in promoting the adhesion between electroless metal layer and the polyolefinic substrate.

3,592,681

METAL SURFACE TREATING PROCESS BY USE OF LANTHANUM COMPOUNDS

Henri Hatwell and Willy Robert De Sutter, Brussels, Belgium, assignors to Cabot Corporation

No Drawing. Filed May 15, 1968, Ser. No. 729,400
Int. Cl. C23c *3/04, 9/00*
U.S. Cl. 117—50 **13 Claims**

Method for improving the oxidation resistance of iron, nickel and cobalt base alloys containing chromium by contacting an alloy of this type with a heat decomposable lanthanum compound at elevated temperature.

3,592,682

WATER ACTIVATED ADHESIVE RIBBON

Sol S. Weiner, Evanston, Burton A. Gale, Skokie, and Heinz A. Diedler, Chicago, Ill., assignors to CPS Industries, Chicago, Ill.

No Drawing. Filed Oct. 27, 1966, Ser. No. 589,849
Int. Cl. C09j *7/04*
U.S. Cl. 117—76A **3 Claims**

A unitary composite remoistenable flexible tape structure which is fabricated from an olefin polymer, such as polypropylene which is generally of an extruded form, an intermediate adhesive bonding layer or tie coating of an organic chemical composition, such as a methylated paraffinic chain hydrocarbon resin of petroleum origin or a polyterpene resin ester or an ethylene/vinyl acetate copolymer, and a remoistenable organic adhesive layer. The bonding layer performs an intermediate adhesive bonding function between the remoistenable adhesive layer, such as a polyvinyl alcohol resinous coating, and the other surface of the tape thereby forming a unitary composite structure.

3,592,683

FLAME RESISTANT MATERIALS AND METHOD OF MAKING SAME

Thomas D. Miles, North Randolph, Mass., and Armando C. Delasanta, Woonsocket, R.I., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Sept. 25, 1969, Ser. No. 861,163
Int. Cl. B44d *5/00;* **D06m** *13/26, 15/16*
U.S. Cl. 117—93.31 **10 Claims**

Process for flameproofing materials, more particularly cotton textile fabrics, comprising impregnating the material with a phosphorus compound, such as triallyl phosphate, and a comonomer, such as N-methylol acrylamide, and thereafter exposing the material to ionizing radiation at a dose level sufficient to cause production of a solid copolymer of the phosphorus compound and the comonomer in situ in the material. The preferred triallyl phosphate and N-methylol acrylamide are present in the impregnating bath in a ratio and concentration such that flame resistance imparted to the material is retained through at least fifteen launderings under standardized conditions. The flameproofed materials prepared by the process, which are durable against at least fifteen launderings, are disclosed.

3,592,684

NYLON AND POLYESTER FIBERS HAVING IMPROVED SOIL RESISTANCE

Andrew I. Smith, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 568,724, July 29, 1966. This application Dec. 26, 1968, Ser. No. 787,269
Int. Cl. D06m *11/04*
U.S. Cl. 117—102L **6 Claims**

Polyamide and polyester fibers are rendered highly resistant to soiling by applying to the fibers during the manufacture thereof a finish comprised of a water soluble

lubricating agent and a zirconium compound, and subsequently scouring the fibers to remove substantially all of the lubricating agent while a major portion of the zirconium compound remains adhered to the fiber.

3,592,685

PROCESS FOR PRODUCING SYNTHETIC CHAMOIS LEATHER-LIKE MATERIAL HAVING IMPROVED WATER ABSORBENCY AND ABRASION RESISTANCE

Hans Boe, Augsburg, Germany, assignor to Carl Freudenberg, Weinheim, Germany

No Drawing. Continuation-in-part of applications Ser. No. 513,524, Dec. 13, 1965, and Ser. No. 800,043, Feb. 13, 1969. This application Aug. 26, 1969, Ser. No. 853,198
Claims priority, application Germany, Dec. 31, 1964, F 44,849
Int. Cl. C08c *17/16*; C08j *1/44*; D06n *3/00, 5/00*
U.S. Cl. 117—140 **6 Claims**

Improved synthetic chamois-like material by providing a water absorbent non-woven textile fleece, impregnating the fleece at least once with a liquid form binder material, at least partially drying the impregnated fleece whereby causing deposition of the impregnated binder material as lamella predominantly at the crossing points of fibers within the textile fleece, applying to both major surfaces of the bonded fleece a liquid form coagulatable rubber latex material under such conditions that the latex remains on the surface or substantially only at the surface of the bonded fleece, and causing the rubber content of the coagulatable latex to coagulate by heating the coated fleece to about 40 to 80° C. The coagulated latex forms a discontinuous particulate coating on the surface of the fleece which significantly reduces pilling.

3,592,686

PROCESS FOR MAKING DURABLE PRESS AND SOIL RELEASE TEXTILE AND RESULTANT ARTICLE

Richard P. Barber and Glen R. Moses, Mooresville, and Daniel L. Waugh, Troutmans, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

No Drawing. Filed June 10, 1968, Ser. No. 735,529
Int. Cl. D06m *15/16*
U.S. Cl. 117—161 **9 Claims**

Process for improving the soil release properties of a textile by treating the same with a mixture of a fluoroacrylic polymer and a water-insoluble acrylic hydrophilic polymer.

3,592,687

PRODUCTION OF MAGNETIC RECORDING MEDIA

Georg Schnell, Job-Werner Hartmann, Heinz Stritzinger, and Werner Senkpiel, Ludwigshafen, Hans Joerg Hartmann, Wachenheim, Erich Albert Sobotta, Ludwigshafen, Karl Uhl, Frankenthal, and Gerhard Werst, Neustadt, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 6, 1969, Ser. No. 789,240
Claims priority, application Germany, Jan. 5, 1968, P 12 99 721.6-53
Int. Cl. H01f *10/02*
U.S. Cl. 117—237 **6 Claims**

A method of producing magnetic recording media by applying to a base a coating of a dispersion of a magnetic pigment, pretreated with wax or wax-like substances, in a special curable copolymer of alkenyl benzene hydrocarbons, (meth)acrylic esters, etherified N-methylamides of (meth)acrylic acid and an additional comonomer, drying and curing the applied coating; and the magnetic recording material thus obtained.

3,592,688

DEXTROSE CRYSTALLIZATION PROCESS

George Rhoades Dean, Edwardsville, and Ronald Emmett Pyle, Granite City, Ill., assignors to Miles Laboratories, Inc.

No Drawing. Filed Sept. 10, 1969, Ser. No. 856,806
Int. Cl. C13k *1/10*
U.S. Cl. 127—60 **11 Claims**

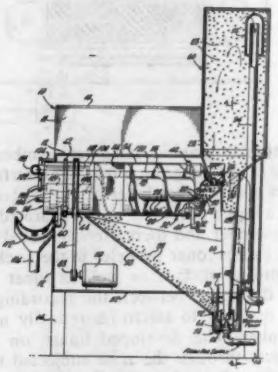
Relatively large crystals of dextrose hydrate can be consistently produced by a process which comprises contacting a supersaturated solution of dextrose with dextrose hydrate seed crystals at a temperature below about 90° F., maintaining the temperature of the dextrose solution in contact with the seed crystals below about 90° F. during dextrose crystallization to form a massecuite and recovering crystals of dextrose hydrate from such massecuite.

3,592,689

METHOD AND APPARATUS FOR CLEANING DUST FROM THE EXTERIOR OF CAPSULES

Frank Chaplinski, Somerset, N.J., assignor to The Nestle-Lemur Company

Filed Jan. 28, 1970, Ser. No. 6,618
Int. Cl. B08b *7/00*
U.S. Cl. 134—1 **11 Claims**



A method and apparatus for cleaning dust away from the exterior of capsules. The capsules which are to be cleaned are intermingled with electrostatically charged pellets which attract the dust away from the capsules onto the pellets. The capsules and pellets are fed together to a given location where the pellets with the dust thereon are separated from the capsules so that the latter can be collected in cleaned condition. The pellets with the dust thereon are then blown up into a supply tower from which the dust is eliminated by a vacuum so that in this way the pellets are cleaned. As the pellets fall down through the tower they become again electrostatically charged, and upon reaching the bottom of the tower, the pellets meet with the dust-covered capsules to again be fed with the latter so that in this way the pellets are continuously recycled.

3,592,690

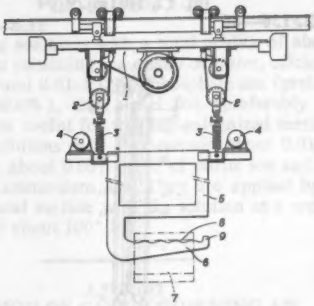
METHOD FOR PICKLING COILS

Rudolf Schoffmann, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed Dec. 30, 1968, Ser. No. 787,852
Claims priority, application Austria, Jan. 11, 1968, A 279/68
Int. Cl. B08b *3/00, 7/00*
U.S. Cl. 134—1 **2 Claims**

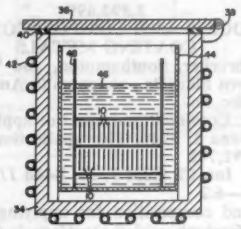
A method for pickling coils of metal strip or wire wherein the coils are centrally supported, to submerge into

the pickle, and vibration is employed to periodically separate the coil windings so as to enable access of the pickle throughout the windings. The invention teaches to use a vibration frequency which is outside the spectrum



of natural frequencies of the coil windings, and a matched vibration amplitude of such extent that the acceleration of fall of the stock to be pickled is exceeded whereby the stock is momentarily taken off its support.

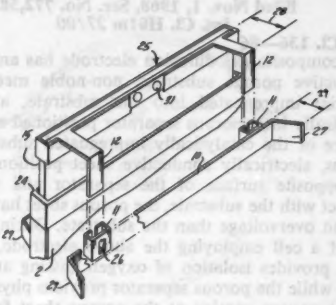
3,592,691
PHOTORESIST REMOVAL METHOD
Manfred K. Stelter, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed July 11, 1968, Ser. No. 744,053
Int. Cl. B08b *3/10*
U.S. Cl. 134—42 **2 Claims**



The method of removing a photoresist layer after photo processing from a semiconductor substrate including the steps of immersing a substrate containing residuals of photoresist masks into a photoresist solvent and heating the solvent to a temperature ranging from about 150° to 250° C. while subjecting the solvent to a pressure of about 300 p.s.i.g. for a time period of from about one-quarter up to three hours.

3,592,692
APPARATUS FOR BATTERY CELL CONNECTIONS
Elihu C. Jerabek, Delmar, N.Y., assignor to the United States of America as represented by the Secretary of the Navy
Filed Feb. 19, 1970, Ser. No. 12,653
Int. Cl. H01m *5/00, 27/00*
U.S. Cl. 136—86 **4 Claims**

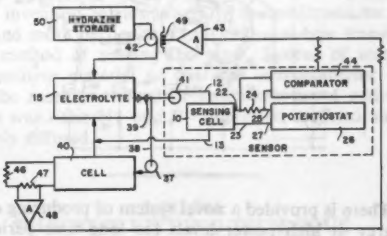
A method and apparatus are disclosed for making intercell connections in a metal-air battery wherein the metal electrode is removed and another inserted. The connection utilizes integral or added parts of the anode and cathode in a low impedance sliding contact. This contact is of low mass, impossible to misconnect, protected from corrosion, does not impede access of air to the air electrode and requires no other wiring to connect the individual cells of the battery in series.



3,592,693
CONSUMABLE METAL ANODE WITH DRY ELECTROLYTIC ENCLOSED IN ENVELOPE
Martin G. Rosansky, Forest Hills, N.Y., assignor to Leesona Corporation, Warwick, R.I.
Filed Feb. 2, 1968, Ser. No. 702,658
Int. Cl. H01m *1/02, 29/04*
U.S. Cl. 136—86 **8 Claims**

A consumable metal electrode for an electro-chemical cell containing an alkaline metal hydroxide electrolyte in dry form is described. Accordingly, a cell employing the electrode can be activated by the addition of water to the cell forming a conductive aqueous electrolyte solution.

3,592,694
HYDRAZINE FUEL CELL CONTROL SYSTEM
Herman B. Urbach, Robert E. Smith, and Robert J. Bowen, Annapolis, and David E. Icenhower, Hillcrest Heights, Md., assignors to the United States of America as represented by the Secretary of the Navy
Filed Sept. 16, 1968, Ser. No. 760,049
Int. Cl. H01m *27/00, 27/02*
U.S. Cl. 136—86 **2 Claims**



Apparatus for controlling hydrazine concentration in fuel cells. A hydrazine sensor comprises an elongated porous anode, guarded from the cathode by a porous separator to prevent cathode gas from contacting the anode. The current output of the sensor is fed into a comparator then into a hydrazine-feeding system which delivers fuel to the fuel cell.

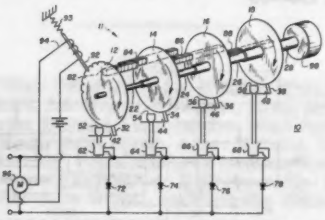
3,592,695
METAL-AIR CELL INCLUDING A COMPOSITE LAMINAR GAS DIFFUSION CATHODE
Paul J. Moran, Ballston Lake, N.Y., assignor to General Electric Company
Filed Nov. 1, 1968, Ser. No. 772,585
Int. Cl. H01m 27/00
U.S. Cl. 136—86 2 Claims

A composite gas diffusion electrode has an electrically conductive porous substrate, non-noble metal catalytic material impregnated into the substrate, at least one chemically inert porous separator positioned adjacent one surface of the catalytically impregnated substrate, and a porous, electrically conductive sheet positioned adjacent the opposite surface of the separator and in electrical contact with the substrate, the porous sheet having a lower oxygen overvoltage than the substrate. During the charging of a cell employing the above electrode, the porous sheet provides isolation of oxygen gassing at the porous sheet while the porous separator provides physical spacing of the oxygen gassing at the porous sheet from the catalytically impregnated substrate.

3,592,696
DIRECT HYDROCARBON FUEL CELL CONTAINING ELECTROLYTE COMPRISING A HALOGENATED ACID AND A LEWIS ACID
Nigel I. Palmer, Port Washington, N.Y., assignor to Leesona Corporation, Warwick, R.I.
No Drawing. Filed Jan. 7, 1969, Ser. No. 789,612
Int. Cl. H01m 11/00, 27/00
U.S. Cl. 136—86 10 Claims

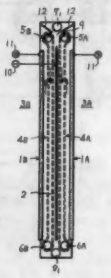
A fuel cell system is described employing a super acid electrolyte. The fuel electrochemically oxidized at the fuel electrode is a carbonaceous material, preferably being a C_1–C_{16} alkane. The preferred super acid electrolyte is antimony pentafluoride-fluorosulfonic acid. This fuel cell system provides a rapid and efficient electrochemical conversion of alkanes and the like to their oxidation products.

3,592,697
RESERVE BATTERY SYSTEM
Leon Braun, Linden, N.J., assignor to Molecular Energy Corporation
Filed Feb. 28, 1969, Ser. No. 803,180
Int Cl. H01m 7/00
U.S. Cl. 136—162 10 Claims



There is provided a novel system of producing electrical energy at high power levels for long time periods. The novel system possessses an indefinite shelf life and may be activated within time periods of the order of seconds. The system comprises a voltage sensing control device, set to activate an electrolyte discharging means which causes electrolyte to flow into an inert battery system activating the same and providing the desired reserve electrical energy. Further means are provided for utilizing the power available in a cell after it has ostensibly fallen below, a predetermined useful level.

3,592,698
METAL FUEL BATTERY WITH FUEL SUSPENDED IN ELECTROLYTE
Hideo Baba, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Nov. 18, 1968, Ser. No. 776,548
Claims priority, application Japan, Nov. 20, 1967, 42/74,625
Int. Cl. H01m 29/04
U.S. Cl. 136—86 11 Claims



A metal fuel battery consisting of a liquid-containing chamber, at least one wall of which is a gas diffusion positive electrode including a metal oxidation catalyst therein, a negative electrode positioned in the chamber and spaced from the positive electrode, a liquid electrolyte having a finely divided metal fuel powder suspended therein and means for circulating the electrolyte through the chamber.

ERRATUM

For Class 136—86 see:
Patent No. 3,592,941

3,592,699
PROCESS AND COMPOSITION FOR COATING METALS
Lester Steinbrecher, Southampton, and Wilbur S. Hall, Germantown Pike, Pa., assignors to Amchem Products, Inc., Ambler, Pa.
No Drawing. Continuation-in-part of application Ser. No. 554,336, June 1, 1966. This application Jan. 16, 1969, Ser. No. 791,762
Int. Cl. C23f 7/26; B44d 1/36
U.S. Cl. 148—6.2 34 Claims

Method and composition for applying a coating to a metallic surface wherein the surface is immersed in an acidic aqueous coating composition comprising particles of resin dispersed in the composition, fluoride ion and an oxidizing agent (H_2O_2 or dichromate) and wherein the weight of coating formed on the surface can be controlled by the time the surface is immersed in the composition.

3,592,700
POLYMER COATING OF METALS
Madeline S. Toy, Fountain Valley, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.
No Drawing. Filed Aug. 5, 1968, Ser. No. 750,026
Int. Cl. B44d 1/092; C23f 7/00
U.S. Cl. 148—6.3 14 Claims

Polymer coated metals and process therefor. The metal surface is first treated with hydrogen fluoride to form an integral, adherent surface coating of metal fluoride. The metal fluoride surface coating is then exposed to a film forming monomer, e.g., tetrafluoroethylene, to cause in situ polymerization thereon and produce a uniform, continuous, adherent polymer coating. Such tetrafluoroethylene polymer coated metal surfaces provide excellent corrosion resistance useful for protective coatings, particularly on metal structural components.

3,592,701
PROCESS FOR PHOSPHATING GALVANIZED METAL ARTICLES

Howard G. Pekar, Cleveland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

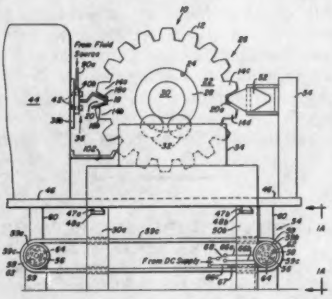
No Drawing. Continuation-in-part of abandoned application Ser. No. 323,134, Nov. 12, 1963. This application Nov. 30, 1967, Ser. No. 686,851
Int. Cl. C23f 7/12
U.S. Cl. 148—6.15 9 Claims

Phosphating solutions with a total acidity of about 5–850 points and consisting essentially of water, calcium ion (preferably about 0.01–8.0%), phosphate ion (preferably about 0.25–20.0%), and nickel ion (preferably about 0.005–2%) are useful for treating galvanized metal articles. These solutions may also contain about 0.01–26% of nitrate ion, about 0.001–0.1% of nitrite ion and about 0.1–1.0% of ammonium ion. They are applied by contacting the metal surface with the solution at a temperature of at least about 100° F.

3,592,702
METHOD OF CASE-HARDENING AN ARCUATE MEMBER

Edward H. Dehn, Oil City, Pa., assignor to United States Steel Corporation

Original application June 26, 1968, Ser. No. 740,131. Divided and this application May 15, 1970, Ser. No. 37,616
Int. Cl. C21d 9/32
U.S. Cl. 148—144 3 Claims



An improved method of surface hardening an arcuate member, such as a large pitch gear, having a first tooth and a second tooth, each tooth having opposed flanks and a root section which define a valley.

The method of surface hardening includes the steps of:

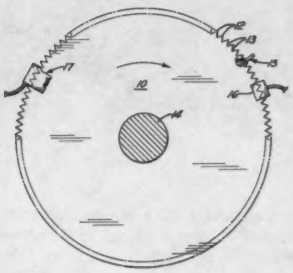
(1) supporting the arcuate member;
(2) preheating a moving area on the flanks and root section;
(3) heating the moving heated area above the hardening temperature of the arcuate member without burning or melting the arcuate member; and
(4) quenching the moving heated area to case-harden such moving heated area.

3,592,703
METHOD FOR TREATING CIRCULAR SAW BLADES AND PRODUCT PRODUCED THEREBY

Edward H. Dehn, Oil City, and Fernand J. Dewez, Jr., Monroeville Borough, Pa., assignors to United States Steel Corporation

Filed Mar. 7, 1968, Ser. No. 711,261
Int. Cl. C21d 9/24
U.S. Cl. 148—147 9 Claims

A method and apparatus for hardening the teeth and tooth roots of a saw blade used for cutting hot steel shapes. Blade rotates, while its teeth and roots are heated to the austenitizing tempertaure and quenched by a stationary induction heating unit and a stationary quenching device. Shield applied to blade to prevent reheating and softening of portion first heated as it re-enters heating unit. The hardening treatment forestalls failure through fatigue-cracking at the roots.



3,592,704
ELECTROLUMINESCENT DEVICE

Ralph A. Logan, Morristown, Harry G. White, Bernardsville, and William Wiegmann, Middlesex, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 28, 1968, Ser. No. 740,903
Int. Cl. H01l 7/38
U.S. Cl. 148—171 6 Claims

Electroluminescent p-n diodes which contain sulphur to produce an excess donor concentration of 5×10^{16} to 2×10^{17} cm.$^{-3}$ exhibit efficiencies of at least an order of magnitude greater than for other n-type dopants. When the diodes are produced in an ammonia atmosphere, efficiency is increased still further.

3,592,705
METHOD OF MAKING SEMICONDUCTOR DEVICE

Tsuneo Kawashima, Tokyo, and Kenji Ohmori, Atsugishi, Japan, assignors to Sony Corporation, Tokyo, Japan

Original application June 26, 1967, Ser. No. 648,694. Divided and this application May 2, 1969, Ser. No. 843,252
Int. Cl. H01l 7/34
U.S. Cl. 148—187 6 Claims

This invention relates generally to semiconductor devices, and more particularly to a diffusion-type transistor and a method of making the same. Instead of using a photosensitive material to coat the semiconductor substrate the mark is formed of an etchant-proof material, such as wax. The N^+ and P^+ impurities are also simultaneously diffused.

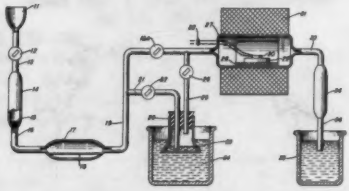
3,592,706
SELECTIVE ETCHING TECHNIQUE FOR SEMICONDUCTORS

Richard S. Wagner, Bernardsville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 20, 1968, Ser. No. 714,526
Int. Cl. H01l 7/50, 7/00
U.S. Cl. 156—17 6 Claims

Preferential etching of crystalline materials is effected by providing a liquid-alloy solution comprising the material to be etched and one or more other components at

a point intermediate a vapor and the solid material to be etched. In the operation of the process, the vapor which is capable of reacting chemically with the material to be etched selectively removes that material from the liquid-

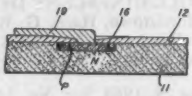


alloy solution, so resulting in undersaturation of the solution with respect to the material to be etched and continuous dissolution of that material at the solid-liquid interface.

3,592,707
PRECISION MASKING USING SILICON NITRIDE AND SILICON OXIDE

Ralph J. Jaccodine, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 17, 1968, Ser. No. 737,533
Int. Cl. C23c *11/06*; H01l *7/44*
U.S. Cl. 156—17 **1 Claim**

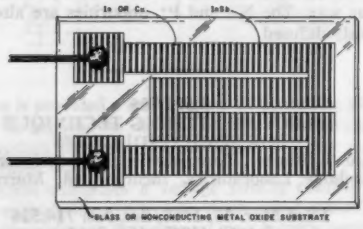


A silicon oxide mask defines the diffusion of a conductivity type zone in a semiconductor body. The surface of the diffused zone then is covered by a layer of silicon nitride which is selectively etched using phosphoric acid. This etchant removes the peripheral portions leaving a central portion of silicon nitride. The semiconductor body then is treated to replace the removed silicon nitride with silicon oxide after which the remaining central portion of silicon nitride is removed, leaving a window to the semiconductor body surface which is registered with respect to the diffused zone and of fine dimensions determined by the etching process.

3,592,708
METHOD OF MAKING RASTER PATTERN MAGNETORESISTORS

David A. Collins, Ontario, and Harry H. Wieder, Riverside, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed July 26, 1968, Ser. No. 748,069
Int. Cl. C23f *17/00*; H01l *7/50*
U.S. Cl. 156—17 **4 Claims**

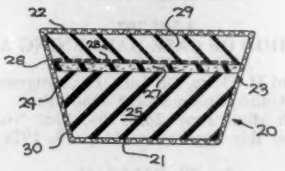


A technique for creating a raster pattern magnetoresistor device from an electron beam-recrystallized InSb film by employing a photolithographic process to etch out of the InSb film a suitable pattern on which micron-size indium or copper stripes are later etched out of a superposed metallic film applied on the InSb by vacuum deposition. The raster pattern magnetoresistor device is a resistor, whose initial resistance in zero magnetic field is between 10 and 1000 ohms, and whose resistance increases with an applied magnetic field, reaching a value greater than a factor of 10 of the initial resistance in a magnetic field of 10K oe.

3,592,709
DRIVE BELT CONSTRUCTION

Alfred Marzocchi and Albert J. Garbin, Cumberland, R.I., assignors to Owens-Corning Fiberglas Corporation

Original application June 27, 1967, Ser. No. 649,164, now Patent No. 3,469,512, dated Sept. 30, 1969. Divided and this application Feb. 24, 1969, Ser. No. 839,098
Int. Cl. B29h *7/22*
U.S. Cl. 156—142 **4 Claims**



A power belt manufacturing method comprising the steps of widing a first rubber layer about a collapsible mandrel, a second stiffer layer about the first layer, winding a length of glass fibers in gathered-together array spirally about the second layer, the array being of flat to oval cross-sectional configuration, repeated winds of the cord being adjacent, winding another layer of stock about the assembly, followed by a cutting of the assembly, a collapsing of the mandrel, a removal of the elements and a vulcanization of the elements to form the power belt.

3,592,710
METHOD OF PRODUCING PRESSURE SENSITIVE ADHESIVES

William J. Yurgen and John M. Questel, Cuyahoga Falls, Ohio, assignors to Morgan Adhesive Company, Stow, County of Summit, Ohio

Continuation-in-part of application Ser. No. 574,721, Aug. 24, 1966. This application Sept. 18, 1969, Ser. No. 864,936
Int. Cl. B32b *31/00*
U.S. Cl. 156—153 **16 Claims**

This method to make an adhesive comprises blending and grinding a mixture of styrene-butadiene copolymers with a solid tackifying material, feeding the pulverized mixture to an extrusion means, and processing and extruding the mixture to form a film of pressure sensitive adhesive as a viscoelastic fluid under controlled temperature conditions above the melting point of the copolymers.

3,592,711
HIGH VOLTAGE FLEXIBLE WINDING INSULATION TAPE

Gerard de Senarclens, Hans Mosimann, and Ernst Diehl, Breitenbach, and Walter Lutz, Laufen, Switzerland, assignors to Schweizerische Isola-Werke

Continuation-in-part of application Ser. No. 351,411, Mar. 12, 1964. This application Sept. 19, 1968, Ser. No. 760,902
Claims priority, application Switzerland, Mar. 14, 1963, 3,216/63
Int. Cl. B32b *19/00*
U.S. Cl. 156—250 **8 Claims**

Flexible winding tapes suitable for insulating machinery rated in excess of 6 kilovolts comprise epoxy resin im-

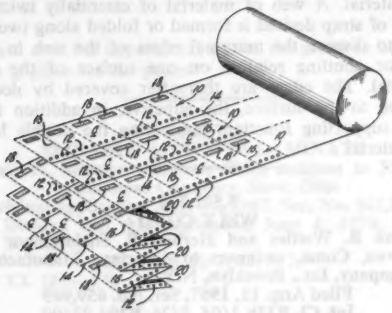
pregnated mica material on a porous carrier. The epoxy resin contains from 0.2 to 1.4% volatiles and is partially cured to impart to the final tape an adhesive temperature lower than 80° C. and/or a flow test value between 5 and 20%. The dielectric loss factor $tg\delta$ for the insulating tape is essentially constant with increases in voltage to 20 kilovolts and is not more than 10% at 100° C.

3,592,712

METHOD OF PREPARING AND APPLYING TO PRINTED MATERIAL SEPARABLE ADVERTISING SHEETS WITH SAMPLES

Craig P. Greason, Berry Hill Road, Syosset, N.Y. 11791

Filed May 10, 1968, Ser. No. 728,138
Int. Cl. B32b *31/18*
U.S. Cl. 156—252 8 Claims



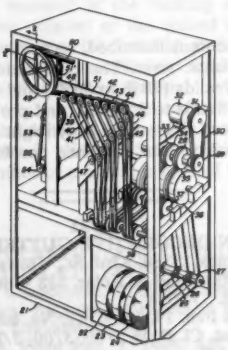
The method of preparing strips of separable advertising cards having samples of products, such as encapsulated fragrances or fabric swatches, and separating the individual cards, applying adhesive and feeding the same at high speed on to a publication being printed on a high-speed press.

3,592,713

V-BELTING AND METHOD OF MANUFACTURE

Lucian J. Beindorf, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Dec. 26, 1967, Ser. No. 693,377
Int. Cl. B32b *31/18;* B29h *3/06*
U.S. Cl. 156—259 4 Claims



V-belting of the non-endless type and method of manufacture in which the belting is formed by continuously assembling strips of rubber-impregnated fabric of different widths and compacting into a finished product.

3,592,714

LAMINAR STRUCTURES OF POLYIMIDES AND METHOD OF MANUFACTURE

Morton Katz, Williamsville, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 26, 1968, Ser. No. 787,249
Int. Cl. B32b *27/08, 27/34;* H01b *3/30*
U.S. Cl. 156—329 2 Claims

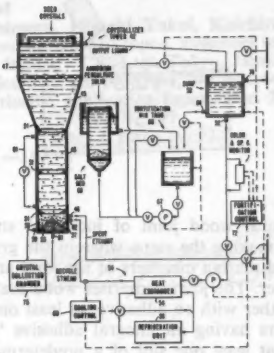
A laminar article is provided of a layer of a polyimide and a layer of a fluorinated polymer, which structure is suitable in the form of narrow tapes for electrical insulation uses.

3,592,715

STEADY STATE ETCHING SYSTEM

Robert T. Lindstrom, Orlando, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Original application Dec. 27, 1966, Ser. No. 604,940, now Patent No. 3,505,135, dated Apr. 7, 1970. Divided and this application Oct. 8, 1969, Ser. No. 870,899
Int. Cl. C23f *1/02*
U.S. Cl. 156—345 5 Claims



A steady state system for the etching of printed circuit boards is provided. A metal is removed from an etchant at the rate in which it is dissolved into the etchant and etching reagent consumed during the etching process is replaced at an equivalent rate. Also provided is an improved crystallization tower which is used to continuously remove the dissolved metal. The tower is provided with a series of adjustable baffles to vary the inner diameter of the tower to control crystal size throughout the column. Additionally, there is included a crystal ejection chamber from which precipitated crystals are ejected by a centrifugal force.

3,592,716

ARTIFICIAL FLOWER OF FUZZY BALL SHAPED CONSTRUCTION

Roger A. Harris, Milwaukee, Wis., assignor to Wisconsin Cooperative Wool Growers Association, Milwaukee, Wis.

Filed Apr. 28, 1969, Ser. No. 819,792
Int. Cl. A41g *1/00*
U.S. Cl. 161—30 6 Claims

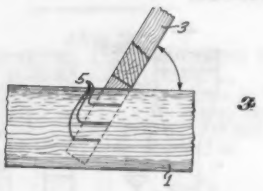
The disclosure is of an ornamental flower constructed of several pre-cut fabric mats bonded to a foam plastic

cylindrical core to form a uniformly round, fuzzy flower. A wire stem extends through the core and hooks back into the core at the top for attachment.

ERRATUM

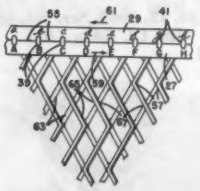
For Class 161—44 see:
Patent No. 3,592,942

3,592,717
GLUED JOINT WITH INTEGRAL ADHESIVE KEY
Wayne C. Gaughran, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed July 20, 1967, Ser. No. 654,756
Int. Cl. C09j *5/02*; E04b *1/00*; F16b *17/00*
U.S. Cl. 161—56 9 Claims



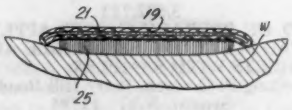
A structural wood joint of increased strength and a method of making the same wherein the grain directions of the wood mating members of the joint are at an angle to each other. The joint comprises wood mating members joined together with an adhesive, at least one of the mating members having an integral adhesive "key" formed by cutting at least one slot of a predetermined size and shape within the adhesive area of the surface of the mating member whose grain direction is at an angle other than zero to the load resultant imposed on the joint, the slot being filled with adhesive.

3,592,718
DIFFERENTIALLY BONDED NET-LIKE STRUCTURES
Theodore H. Fairbanks, Liverpool, Pa., assignor to FMC Corporation, Philadelphia, Pa.
Original application July 27, 1967, Ser. No. 656,501. Divided and this application Sept. 24, 1969, Ser. No. 860,666
Int. Cl. B32b *5/12*
U.S. Cl. 161—58 7 Claims



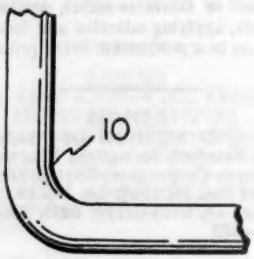
An extruded net-like structure having intersecting mesh strands in which at least some of its individual mesh strands are bonded to certain of the intersecting strands at their points of crossing to form integral, unitary strand junctions and are unconnected to other of such intersecting strands at their points of crossing.

3,592,719
GARMENT STRAP MATERIAL
Claude V. Offray, Jr., 21 Portland Road, Summit, N.J. 07901
Filed Oct. 25, 1968, Ser. No. 770,649
Int. Cl. A41f *15/00*
U.S. Cl. 161—64 1 Claim



An improved garment strap material and method of making the same, the strap comprising a double thickness of material. A web of material of essentially twice the width of strap desired is formed or folded along two fold lines to dispose the marginal edges of the web in adjacent or abutting relation on one surface of the strap material. The edges are thereafter covered by flocking bonded to the surface, the adhesive, in addition to its flock supporting function, laminating the double layers of material.

3,592,720
WELT CORD
Gurdon B. Wattles and Herbert S. Sneiderman, New Haven, Conn., assignors to American Manufacturing Company, Inc., Brooklyn, N.Y.
Filed Aug. 11, 1967, Ser. No. 659,969
Int. Cl. B32b *3/04, 3/26*; B29d *27/00*
U.S. Cl. 161—101 12 Claims

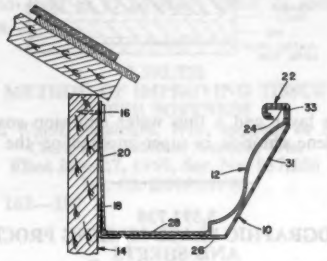


A welt cord core is described, formed of a foamed synthetic thermoplastic resin. The core material has a very high percent of voids (70% to 80%) and very small average pore size (8 mils to 25 mils), and provides a soft and resilient welt cord that suffers only slight deformation on cornering. Specific resins disclosed are EEA, EVA, and polyethylene.

3,592,721
SNAP-ON DECORATIVE GUTTER COVER
Milton Formanek, 3350 83rd St., Downers Grove, Ill. 60515, and Raymond A. Kolar, 238 Woodstock, Clarendon Hills, Ill. 60514
Filed Feb. 19, 1969, Ser. No. 800,537
Int. Cl. B32b *1/00, 3/00, 3/04*
U.S. Cl. 161—125 4 Claims

A decorative gutter cover comprises a trough-like molding strip which is adapted to be attached to and to fit over the outer surface of a gutter, which may be already in place on a building. The strip includes at its rear end an upstanding flange which is adapted to be inserted

between the lower end of the gutter and the building, and at its upper forward end a horizontal flange which can



be bent over the upper distal end of the gutter to hold the strip in place on the gutter.

3,592,722

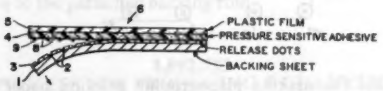
SLIDABLE ADHESIVE LAMINATE

Burton D. Morgan, Hudson, Ohio, assignor to Morgan Adhesives Company, Stow, Ohio

Original application Aug. 16, 1967, Ser. No. 661,047. Divided and this application June 4, 1970, Ser. No. 43,481

Int. Cl. B32b *3/00, 7/14*

U.S. Cl. 161—148 4 Claims



A slidable adhesive laminate composed of several distinct layers including a pressure sensitive adhesive layer, a layer of vinyl film or the like, a layer of release material covering the exposed surface of the adhesive layer, and a backing sheet for the layer of release material. There are two different release layers which consists of a first continuous layer covering the adhesive layer and a second discontinuous layer between the first layer and the backing sheet, removal of the backing sheets from the laminate causing removal of the second release material layer and the portion of the first release material layer not covered by the second discontinuous layer, the remaining portions of the first release material layer remaining in contact and projecting from the surface of the adhesive layer to hold the adhesive layer away from the receptive surface and permit sliding of the laminate along the surface until sufficient pressure is applied to the laminate.

3,592,723

BONDED POLYETHYLENE GLYCOL TEREPHTHALATE ESTER FIBERS

Frank Lamb, Chadderton, Oldham, and John Michael Heaps, Gatley, England, assignors to Geigy Chemical Corporation, Greenburgh, N.Y.

No Drawing. Filed Feb. 2, 1966, Ser. No. 524,475

Int. Cl. D04h *1/04;* C09j *5/00*

U.S. Cl. 161—150 11 Claims

Polyester fibers bonded with a cyclic acetal by a process comprising contacting the outer surface of a mass of fibers with said cyclic acetal and heating the fiber mass at a temperature of from 100° to 250° C. Such bonded polyester fibers are useful in packaging and insulating.

3,592,724

CEMENTITIOUS LAMINATE OF SULFONATED POLYMERS

Frank King, Jr., Wilhelm E. Walles, and Fred M. Giachino, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,093

Int. Cl. B12l *27/30, 27/32*

U.S. Cl. 161—160 12 Claims

Laminates of surface sulfonated resinous films and inorganic cementitious materials have good water vapor barrier characteristics and good bond strength. They are useful in the construction industry for making walls, floors, ceilings and plasterboards, having improved water vapor impermeability.

3,592,725

COMPOSITE SHEET OF A THERMOPLASTIC SYNTHETIC RESIN FILM WITH SOLID PARTICLES PARTIALLY EMBEDDED IN THE SURFACE OF THE FILM

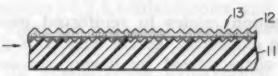
Saburo Yoshimura, Hisaaki Yokoi, Koichiro Sato, and Motoo Yamane, Tokyo, Japan, assignors to The Kokusaku Pulp Industry Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1966, Ser. No. 604,446

Claims priority, application Japan, Dec. 29, 1965, 41/81,317

Int. Cl. B32b *19/02*

U.S. Cl. 161—162 4 Claims



The surface of a synthetic resin film is made suitable for writing or printing by providing a visibly continuous layer of finely divided particles of clay, talc or cellulosic pulp on the film, the particles being partially embedded in the resin film.

3,592,726

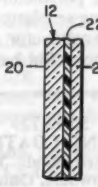
COMPOSITE VEHICLE CLOSURE COMPRISING AN INNER SHEET OF CHEMICALLY STRENGTHENED GLASS

John R. Blizard, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of application Ser. No. 451,484, Apr. 28, 1965. This application Nov. 24, 1969, Ser. No. 879,317

Int. Cl. B32b *7/06, 17/10*

U.S. Cl. 161—164 3 Claims



This invention relates to a multi-layer glass article suitable for use as a vehicle closure such as, for example, an automobile windshield. More specifically, this invention relates to vehicle closures comprising an inner sheet of chemically strengthened glass bonded by a transparent plastic interlayer to an outer sheet of glass which, if

strengthened at all, is strengthened to a lesser degree than the inner sheet. The inner sheet has a greater resistance to fracture by a blunt object than the outer, a greater ability to flex than the outer, and will dice into very small particles when fractured if heavily impacted.

3,592,727
WIRE REINFORCED PLASTIC COMPOSITIONS
Earl D. Weaver and Walter J. Manson, Niles, Mich., assignors to National-Standard Company, Niles, Mich.
Filed May 15, 1968, Ser. No. 729,160
Int. Cl. E04c *5/00*
U.S. Cl. 161—168 **8 Claims**

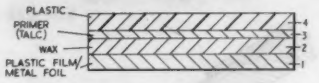
The invention relates to reinforced plastic compositions having embedded therein lengths of discrete wires, said wires characterized by having successive portions thereof of rectangular cross-sectional configuration joined by portions of substantially round configuration in cross-section.

3,592,728
INSULATED ELECTRICAL CONDUCTOR
Gordon J. Muise, Westboro, Mass., assignor to United States Steel Corporation
No Drawing. Filed Feb. 20, 1969, Ser. No. 801,188
Int. Cl. H01b *7/28*
U.S. Cl. 161—175 **2 Claims**

The insulated conductor of the invention comprises an electrically conductive metal core having a polyolefin insulating cover thereon and an elastomer sheath over the insulating cover. The elastomer sheath is bonded to the polyolefin cover by a suitable thermally applied adhesive composition. The method of the invention comprises the steps of providing an electrically conductive metal core, covering the core with a polyolefin insulating layer, heating the insulating layer to a temperature of 400 to 500° F., then applying a suitable adhesive composition to the insulating layer while it is in the temperature range of 400 to 500° F., then applying a second application of the adhesive composition to the polyolefin-adhesive covered conductor, and then applying an elastomer sheath to the polyolefin-adhesive covered conductor after the second application of adhesive composition has been applied thereto.

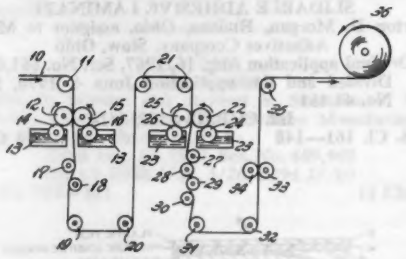
3,592,729
ANTI-BLOCKING COATED WRAPPER
Vernon d'Eyncourt Strickland, Toronto, and William Gemmell Reid, Willowdale, Ontario, Canada, assignors to E. S. & A. Robinson (Canada) Limited, Toronto, Ontario, Canada
Filed Mar. 11, 1968, Ser. No. 712,127
Claims priority, application Canada, Jan. 3, 1968, 9,021
Int. Cl. B44d *1/14*; B32b *23/04*
U.S. Cl. 161—220 **16 Claims**

An anti-blocking, wax coated, heat-sealable wrapper which is particularly suitable for use in long term storage of cheese. The wrapper has a conventional foil or thermoplastic substrate upon which a moisture proof layer of wax is applied. A priming agent, such as talc is applied



to the wax layer and a thin water emulsion coating of polyvinylidene chloride is super-imposed on the primed wax layer.

3,592,730
PLANOGRAPHIC PLATE-MAKING PROCESS AND SHEETS
Douglas A. Newman, Glen Cove, N.Y., assignor to Columbia Ribbon and Carbon Manufacturing Co., Inc., Glen Cove, N.Y.
Filed Jan. 21, 1969, Ser. No. 792,425
Int. Cl. D21f *11/00*
U.S. Cl. 162—137 **7 Claims**



Process for making planographic printing paper in a continuous operation on a paper-making machine. A paper web is formed from an aqueous slurry and dried to the point that it contains from about 5% to about 30% moisture and is self-supporting. A coating of insolubilizing sizing composition, comprising a hydrophilic film-forming binder material such as polyvinyl alcohol is applied to both sides of the web, the sized web is heated sufficiently to dry the sizing composition to the point that it is non-tacky, but without substantial insolubilization of the size, and then a coating of self-insolubilizing planographic composition, comprising 1 part by weight of a hydrophilic film-forming binder material, such as polyvinyl alcohol an insolubilizing agent such as glyoxal, and from 4 to 8 parts by weight of a filler, such as clay, silica, or a mixture of both, is applied to at least one side of the web. Finally the coatings are insolubilized together and the web is calendered, all on the paper-making machine.

3,592,731
PHOTOGRAPHIC PAPER COMPRISING A CATIONIC AMINO ALDEHYDE RESIN AND A CATIONIC POLYAMIDE-EPICHLOROHYDRIN RESIN AND AN ANIONIC POLYACRYLAMIDE DRY STRENGTH RESIN AND METHOD FOR ITS MANUFACTURE
William H. Griggs, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Oct. 24, 1968, Ser. No. 770,427
Int. Cl. D21h *3/48*; G03c *1/86*
U.S. Cl. 162—164 **18 Claims**

A photographic paper base comprising a cationic thermosetting amino-aldehyde wet-strength resin, a cationic thermosetting polyamide - epichlorohydrin wet - strength

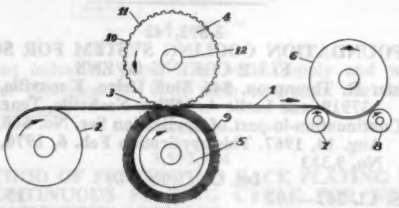
resin, and an anionic polyacrylamide dry-strength resin. This combination of three different resins gives adequate strength properties while providing an aldehyde concentration which is great enough to provide the desired hardening of photographic emulsion applied to the paper base yet not so great as to adversely affect its sensitometric properties.

3,592,732

METHOD OF IMPROVING TISSUE PAPER SOFTNESS

Edwin R. Wand, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed June 27, 1969, Ser. No. 837,256
Int. Cl. D21f *11/00*
U.S. Cl. 162—197 9 Claims



Improved softness, surface smoothness and limpness in tissue paper is attained with a minimum of tissue paper sheet strength loss. The traveling tissue paper, that is creped wadding, is subjected to a nip between a brush roll and a patterned backing roll at controlled relative speeds of the sheet, patterned backing roll and brush. The sheet speed is less than the peripheral speed of the brush roll but greater than that of the backing roll so that the sheet is worked by the brush and patterned backing roll as it slips relative to the patterned backing roll.

3,592,733

PROCESS FOR PRODUCING 5-GUANYLIC ACID NUCLEOTIDES

Shigeo Abe, Tokyo, and Akira Furuya and Ryo Okachi, Machida-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Filed Mar. 15, 1968, Ser. No. 713,308
Claims priority, application Japan, Mar. 18, 1967, 42/16,626
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 12 Claims

A process for producing 5'-guanylic acid nucleotides such as 5'-guanosine-mono-, di- and triphosphoric acid from 5'-xanthylic acid by fermentation which comprises culturing mutant strains of microorganisms having suitable properties under aerobic conditions in an aqueous nutrient medium containing 5'-xanthylic acid. Surface active agents may be added to the medium. The products are useful, for example, as flavoring agents.

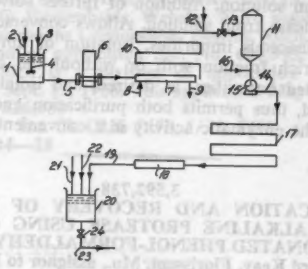
3,592,734

PROCESS FOR CONVERTING STARCH AND OTHER POLYSACCHARIDES INTO DEXTROSE AND MALTOSE CONTAINING PRODUCTS

Karl K. K. Kroyer, Vestre Kongevej 80, Aarhus Viby, Denmark

Continuation of application Ser. No. 577,302, Sept. 6, 1966. This application July 28, 1969, Ser. No. 849,243
Claims priority, application Denmark, Sept. 9, 1965, 4,627
Int. Cl. C12b *1/00*
U.S. Cl. 195—31 10 Claims

An improved process for converting starch and starch-containing material into dextrose and maltose containing products having a high DE value is disclosed. The process comprises the steps of subjecting starch milk to acid hydrolysis under superatmospheric pressure and at a temperature above 100° C. to obtain a product having a DE value below 10. The product is then neutralized and



cooled after which it is subjected to enzymatic liquefaction and finally to enzymatic saccharification.

3,592,735

5-(HYDROXYANILINO)-1,2,3,4-THIATRIAZOLES AND METHOD OF MAKING SAME

Robert John Theriault, Kenosha, Wis., and Thomas Howard Longfield, Atlanta, Ga., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Continuation-in-part of abandoned application Ser. No. 636,676, May 8, 1967. This application Apr. 2, 1968, Ser. No. 718,247
Int. Cl. C12d *13/00*
U.S. Cl. 195—51 7 Claims

5-(hydroxyanilino)-1,2,3,4-thiatriazoles and a method of preparing them by microbial transformation of 5-anilino-1,2,3,4-thiatriazole. These compounds are particularly useful for counteracting hypertension in warm-blooded animals.

3,592,736

PURIFICATION AND SEPARATION OF NEUTRAL PROTEASE FROM PIGMENT AND ALKALINE PROTEASE

Leonard Keay, Florissant, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Aug. 14, 1968, Ser. No. 752,460
Int. Cl. C07g *7/02*
U.S. Cl. 195—63 21 Claims

Water-clear enzyme solution, e.g., beer filtrate from *B. subtilis* microorganism production of enzymes or redissolved enzyme mixture, containing both neutral and alkaline protease, as well as undesirable impurities and pigments, can be treated to separate neutral protease from alkaline protease adsorption of neutral protease on hydroxylapatite and subsequent isolation thereof by elution therefrom. Impurities are also removed by the adsorption-elution process. Degree of purity of final neutral protease depends upon degree of purity of starting material.

3,592,737

PURIFICATION AND FRACTIONATION OF PROTEASE AND AMYLASE ACTIVITIES IN ENZYME MIXTURE

Leonard Keay, Florissant, and Richard G. Anderson, Ferguson, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Aug. 14, 1968, Ser. No. 752,459
Int. Cl. C07g *7/02*
U.S. Cl. 195—66R 23 Claims

Addition of soluble calcium salt, such as calcium acetate, at moderately high levels, e.g., about 1–2% weight/volume, to an enzyme solution, e.g., a clarified fermentation beer, or aqueous solution of redissolved solids precipitated from such beer, containing protease or amylase together with proteinaceous impurities, precipitates proteinaceous impurities directly without removing enzymes

from solution. Addition of solvent prior to, concurrently with, or after calcium salt precipitation, precipitates amylase from solution. Addition of further solvent precipitates protease from solution. Allows convenient removal of proteinaceous impurities, isolation of amylase in an amylase-rich fraction with or without the calcium salt precipitated impurities, as desired, and isolation of protease and, thus permits both purification and fractionation of the enzymatic activity in a convenient manner.

3,592,738

PURIFICATION AND RECOVERY OF NEUTRAL AND ALKALINE PROTEASE USING CATIONIC SULFONATED PHENOL-FORMALDEHYDE RESIN

Leonard Keay, Florissant, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Aug. 14, 1968, Ser. No. 752,462
Int. Cl. C07g *7/02*
U.S. Cl. 195—66R **13 Claims**

Aqueous solution of protease, e.g., a clarified beer from *B. subtilis* microorganism production of enzymes or redissolved enzyme mixture, is treated with sulfonated phenol-formaldehyde cationic exchange resin to eliminate undesirable colored materials and any amylase present. Protease is adsorbed; amylase and most pigmented impurities are not. Neutral protease can be recovered or alkaline protease can be recovered; both can be recovered together or with fractionation when both are present. Use of neutral pH solutions for elution eliminates pigment elution problems, and use of low ionic strength solutions in preparation of resin and for adsorption allows recovery of maximum range of proteases. Fractionation is effected by use of moderate ionic strength solution for elution of neutral protease and higher ionic strength solution for alkaline protease. Where fractionation is not required, elution may be with high ionic strength solution.

3,592,739

PURIFICATION OF LACTASE

Moshe Sternberg, South Bend, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Dec. 19, 1968, Ser. No. 785,361
Int. Cl. C07g *7/02*
U.S. Cl. 195—66 **10 Claims**

Lactase can be isolated and separated from impurities by mixing a lactase-containing solution with a heteropoly acid to form a precipitate with the lactase. The resulting precipitate is then separated from the remaining solution. Useful heteropoly acids are phosphotungstic acid, arsenotungstic acid, silicotungstic acid, borotungstic acid, phosphomolybdic acid, arsenomolybdic acid, silicomolybdic acid, boromolybdic acid, phosphovanadic acid, arsenovanadic acid, silicovanadic acid, borovanadic acid and mixtures and combinations thereof.

3,592,740

PRODUCTION OF CELL CULTURE CONCENTRATES

Verle Wayne Christensen, Madison, Wis., assignor to Niles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Mar. 28, 1968, Ser. No. 717,010
Int. Cl. C12b *1/00*
U.S. Cl. 195—96 **8 Claims**

Novel cell culture concentrates having improved activity can be prepared by a process of inoculating a liquid buffered milk-containing culture medium with an appropriate lactic acid-producing bacterial culture, incubating said inoculated medium to grow bacterial culture cells therein until a desired pH level is attained, adding alkaline material to raise the medium pH to a desired level, cooling the medium and separating the bacterial culture cells from the liquid portion of the culture medium to form a cell culture concentrate.

3,592,741

METHOD FOR ANALYSIS OF UREA

Leonard A. Hughes, 1526 Mountain Blvd., Oakland, Calif. 94611

No Drawing. Continuation-in-part of application Ser. No. 523,023, Jan. 26, 1966. This application June 5, 1968, Ser. No. 734,530
The portion of the term of the patent subsequent to Nov. 5, 1985, has been disclaimed
Int. Cl. G01n *31/14*
U.S. Cl. 195—103.5 **3 Claims**

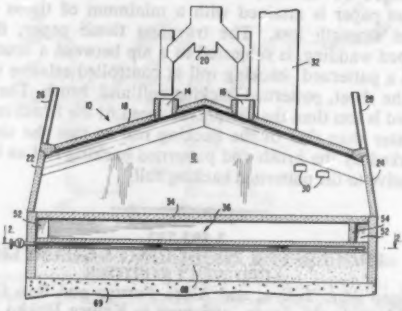
A method for determining urea comprising the incubation of the sample containing urea in a buffered solution containing urease and nitroprusside, followed by the addition of a source of phenate ion and a source of hypochlorite ion in an alkaline medium to produce a color reaction.

3,592,742

FOUNDATION COOLING SYSTEM FOR SOLE FLUE COKING OVENS

Buster R. Thompson, 846 Bluff Drive, Knoxville, Tenn. 37919, and Leslie A. Miller, Nashville, Tenn.

Continuation-in-part of application Ser. No. 660,322, Aug. 14, 1967. This application Feb. 6, 1970, Ser. No. 9,333
Int. Cl. C10b *5/06*
U.S. Cl. 202—102 **15 Claims**



A cooling system for the support structure of a coking oven having a plurality of heating flues extending beneath the floor to supply heat to the coking chamber. A plurality of air ducts, or tunnels extend beneath the sole flues in the oven support structure and one into the oven stack to draw cooling air through the support structure beneath the sole flues and discharge it directly into the waste gas in the stack to reduce the temperature of the support structure.

3,592,743

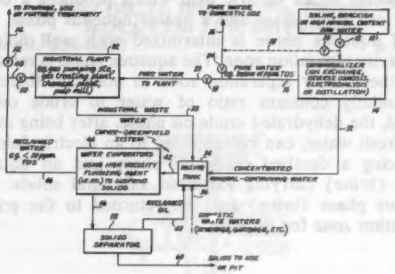
MULTIPLE RE-USE OF WATER

Walter H. Chapman and John F. Eichelmann, Jr., El Paso, Tex., assignors to El Paso Southern Company, El Paso, Tex.

Filed Mar. 26, 1968, Ser. No. 716,222
Int. Cl. B01d *1/00*; C02b *1/06*
U.S. Cl. 203—10 **8 Claims**

This invention relates to the treatment of saline, brackish or other high mineral content water to provide effluent waters for domestic and industrial usage and to the treatment of the domestic and industrial waste water for multiple reuse so as to solve both water supply and waste water pollution problems. The invention combines a demineralization system with a system utilizing a relatively non-volatile fluidizing liquid and capable of operating on waste waters of relatively high solids content, the latter system receiving high mineral content effluent from the demineralizer as well as waste waters from the industrial and/or domestic sources. Potable water and low mineral content waters for industrial use are produced and substantially

all water is reused excepting that lost by evaporation to the atmosphere or by use in irrigation. The system is particularly well adapted for small communities having an



adjacent industrial plant. The water supply and waste disposal problems for both town and plant are solved simultaneously.

3,592,744

METHOD OF PREVENTING RACK PLATING IN CONTINUOUS PLATING CYCLE FOR NON-CONDUCTIVE ARTICLES

John J. Grunwald, New Haven, Eugene D. D'Ottavio, Thomaston, and Frank L. Durso, Cheshire, Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

No Drawing. Filed Dec. 2, 1968, Ser. No. 780,567

Int. Cl. C23b *5/60;* **B44d** *1/092;* **B23b** *27/00*

U.S. Cl. 204—20 **5 Claims**

A method is disclosed for treating plastic sheathed metal jigs or racks conventionally used in supporting and transporting nonconductive articles through chemical and electroplating solutions in the course of a continuous plating cycle for metallizing the articles, whereby to prevent or reduce deposit of metal on the racks themselves. To this end, the racks are treated to cause adsorption of hexavalent chromium ions at the surface of their plastic sheathed portions.

3,592,745

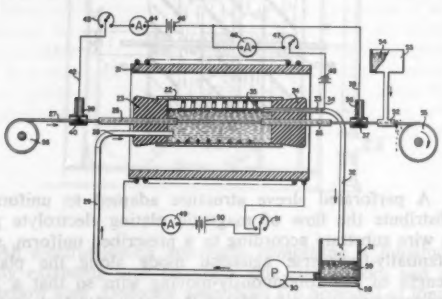
PROCESS FOR MANUFACTURING A MAGNETIC MEMORY

Wilbur G. Hespenheide, Westlake Village, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Division of application Ser. No. 630,995, Apr. 14, 1967, which is a continuation of application Ser. No. 826,088, May 15, 1969. Said application Ser. No. 630,995, being a division of application Ser. No. 763,241, Sept. 25, 1958, now Patent No. 3,545,745. This application Apr. 17, 1969, Ser. No. 816,917

Int. Cl. C23b *5/32, 5/58, 5/68*

U.S. Cl. 204—28 **17 Claims**



To form a magnetic memory matrix, a wire matrix is formed of intersecting insulated and uninsulated conductors and then ferromagnetic material is coated upon the uninsulated conductors.

3,592,746

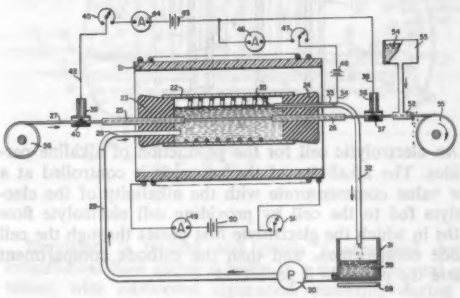
ELECTROPLATING METHOD OF FABRICATING PLATED WIRE MEMORY UNITS

Wilbur G. Hespenheide, Webster, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of application Ser. No. 630,995, Apr. 14, 1967, which is a division of application Ser. No. 763,241, Sept. 25, 1958. This application May 15, 1969, Ser. No. 826,088

Int. Cl. C23b *5/58, 5/32, 5/68*

U.S. Cl. 204—28 **8 Claims**



A ferromagnetic material is electroplated onto a continuous solid conductor in the presence of a magnetizing field of controllable direction so that the electrodeposit has a preferred axis of magnetization in a controlled direction, for example in a helical direction. The magnetizing field is the resultant of two additive magnetizing fields acting together, one of which is circumferential and the other axial when a helical preferred axis is desired.

ERRATUM

For Class 204—49 see:
Patent No. 3,592,943

3,592,747

METHOD OF FORMING A DECORATIVE AND PROTECTIVE COATING ON A SURFACE

Charles C. Cohn, Atlantic City, N.J., assignor to Samuel L. Cohn & Charles C. Cohn, copartners trading and doing business as Colonial Alloys Company, Philadelphia, Pa.

No Drawing. Filed Aug. 17, 1966, Ser. No. 572,916

Int. Cl. C23f *17/00;* **B23b** *15/04;* **C23c** *1/08*

U.S. Cl. 204—38R **12 Claims**

Process of forming on a surface a decorative coating resistant to corrosion and abrasion which comprises forming a loosely adherent porous film of particles on the surface, applying a silicate solution to the film coated surface, drying the silicate-film coating and heating the dried silicate-film coating to insolubilize the silicate.

3,592,748

PREPARATION OF QUINONES

Pius A. Wehrli, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Continuation-in-part of application Ser. No. 841,130, July 11, 1969. This application Apr. 13, 1970, Ser. No. 28,093

Int. Cl. C07b *3/00;* **C07c** *49/64*

U.S. Cl. 204—78 **16 Claims**

Preparation of quinones and naphthoquinones from phenols or naphthols by subjecting an aqueous solution containing the phenol or the naphthol and a hydroxylamine disulfonate to electrolysis.

3,592,749

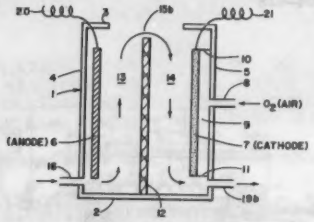
ELECTROLYTIC PROCESS OF PRODUCING AN ALKALINE PEROXIDE

Donald H. Grangaard, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Original application Jan. 30, 1967, Ser. No. 612,469, now Patent No. 3,506,560, dated Apr. 14, 1970. Divided and this application Jan. 5, 1970, Ser. No. 588

Int. Cl. B01k *3/00*; C01b *15/00*

U.S. Cl. 204—84 3 Claims



An electrolytic cell for the production of alkaline peroxides. The alkalinity of the peroxide is controlled at a low value commensurate with the alkalinity of the electrolyte fed to the cell by providing cell electrolyte flow paths in which the electrolyte first passes through the cell anode compartment and then the cathode compartment where the peroxide is generated.

3,592,750

ELECTRODES FOR USE IN AQUEOUS ALKALI METAL CHLORIDE ELECTROLYTES

Denis Lee, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Oct. 21, 1968, Ser. No. 769,377

Claims priority, application Great Britain, Nov. 10, 1967, 51,218/67

Int. Cl. B01k *3/06*; C01b *11/26*; C23b *5/24*

U.S. Cl. 204—95 11 Claims

The invention relates to a platinum metal coated titanium electrode for use in electrolysis of brine. By electroplating the platinum group metal from an electrolyte containing certain organic addition agents the resulting plated electrode is "activated."

3,592,751

PENICILLIN SULFOXIDE CONVERSION PROCESS

Robert A. Archer and Douglas O. Spry, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 806,311, Mar. 11, 1969. This application Apr. 14, 1969, Ser. No. 816,114

Int. Cl. B01j *1/10*

U.S. Cl. 204—158 5 Claims

Converting 2-(C_2 to C_4-alkanoyloxy)methyl penicillin sulfoxides to a mixture of 1-S:2-S, 1-S:2–R, 1-R:2-S and 1-R:2-R isomers by exposing such penicillin sulfoxides to ultraviolet light in the presence of acetone, the products from which treatment are useful for the production of 3-alkanoyloxymethylcephalosporin antibiotically active compounds, e.g., cephalothin, a commerical antibiotic.

3,592,752

SYSTEM FOR TREATING WELL FLUIDS CONTAINING CRUDE OIL ADMIXED WITH LARGE VOLUMES OF WATER

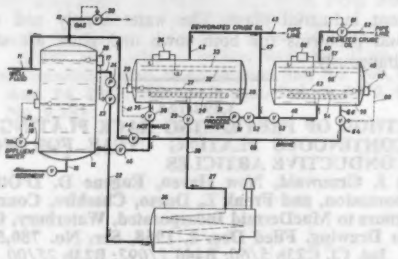
Reinhold T. Pfeifer, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Apr. 28, 1969, Ser. No. 819,910

Int. Cl. B03c *5/00*, *5/02*

U.S. Cl. 204—188 6 Claims

A system including process and apparatus for treating a well fluid (i.e., a mixture of highly viscous crude oil with large volumes of water and some solids) produced by conducting thermal recovery operations in subterranean reservoirs. The well fluid is separated in a gravity separation zone into an oil-free aqueous phase and a wet crude oil phase. The wet crude oil, after being heated, is subjected to an electric field which produces a dehydrated crude oil phase and a heated aqueous phase. The heated aqueous phase is intermixed with well fluid in the gravity separation zone. The aqueous phase is removed from the gravity separation zone to maintain therein a substantially constant ratio of water to crude oil. If desired, the dehydrated crude oil phase, after being mixed with fresh water, can be subjected to an electric field for producing a desalted crude oil phase and an aqueous phase (brine) carrying extracted salts and solids. This aqueous phase (brine) may be returned to the gravity separation zone for disposal.



The present system is especially suited for treating a well fluid which is a mixture of crude oil and water in volume ratios greater than 1 to 2, and especially wherein the volume ratio is about 1 to 10.

3,592,753

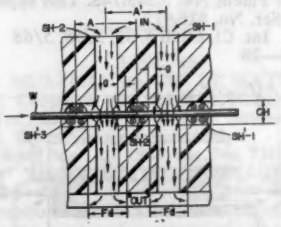
MAGNETIC PLATING CELL

Peter P. Semienko, Roslindale, and Emil Toledo, Brighton, Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 10, 1967, Ser. No. 637,482

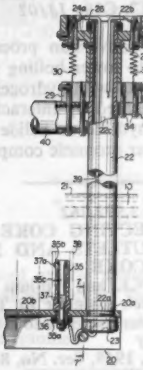
Int. Cl. C23b *5/58*; B01k *3/00*

U.S. Cl. 204—206 11 Claims



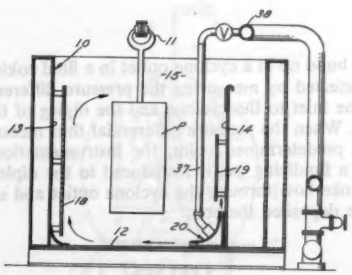
A perforated sleeve structure adapted to uniformly distribute the flow of magnetic plating electrolyte past a wire substrate according to a prescribed uniform, substantially-transverse agitation mode along the plating length of the continuously-moving wire so that a thin magnetic film may be plated thereon under high current density/high agitation conditions; this being especially adapted for plating Permalloy memory films having prescribed, carefully controlled, magnetic properties including "near-zero" magnetostriction.

3,592,754
APPARATUS FOR THE ANODIC OXIDATION OF A PLURALITY OF ALUMINUM WORKPIECES
Kosaku Aihara, 36 Kizukiohmachi, Kawasaki-shi, Kanagawa-ken, Japan
Filed Oct. 28, 1968, Ser. No. 770,959
Int. Cl. C23b 5/70; B01k 3/00
U.S. Cl. 204—297 6 Claims



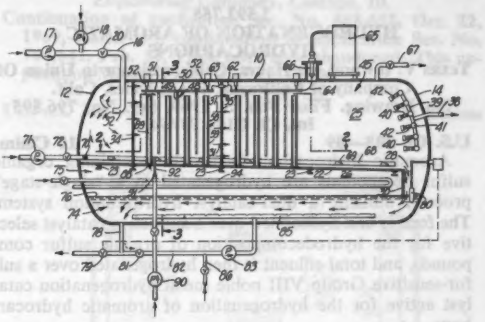
This invention relates to a process for the mass-productive formation of hard oxide coating on a number of aluminum stocks through anodic oxidation technique, wherein said stocks immersed in an electrolytic acid bath and connected electrically in parallel to the anodic side of an electrolytic current source. The process is characterized by that said stocks are connected to the anode through the intermediary of respective resistors. The resistance values of these resistors are preferably so selected that a voltage drop, in the order of say amounting to 1–2 volts will take place in the anodic current path.

3,592,755
ELECTROPAINTING APPARATUS
Lyman L. Thornton, Waterford, Mich., assignor to Mahon Technology Group, Inc., Sterling Heights, Mich.
Filed Sept. 24, 1968, Ser. No. 761,930
Int. Cl. B01k 3/00, 5/00
U.S. Cl. 204—299 15 Claims



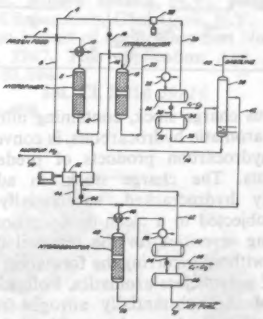
An electropainting apparatus comprising a longitudinally extending tank having a side and bottom and an overflow area. Deflector assemblies are provided at longitudinally spaced points at the areas of juncture of the side and bottom walls and liquid is introduced into the assemblies and directed by the assemblies transversely of the tank to cause a transverse circulation.

3,592,756
EMULSION TREATER
Howell R. Jarvis, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.
Filed Mar. 15, 1968, Ser. No. 713,424
Int. Cl. C10g 33/02
U.S. Cl. 204—302 20 Claims



Emulsion is treated and partially separated during longitudinal flow above a baffle in a long horizontal container, with additional separation occurring during return flow beneath the baffle. The emulsion may be electrically treated while flowing above the baffle, as by flow between depending and upstanding elongated electrode members. Provision is made for treating any sludge that forms. The emulsion treater is particularly applicable to treatment of crude oils and the desalting thereof.

3,592,757
COMBINATION HYDROCRACKING-HYDROGENATION PROCESS
William J. Baral, Long Beach, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
Filed Mar. 17, 1969, Ser. No. 807,682
Int. Cl. C10g 37/06
U.S. Cl. 208—58 7 Claims



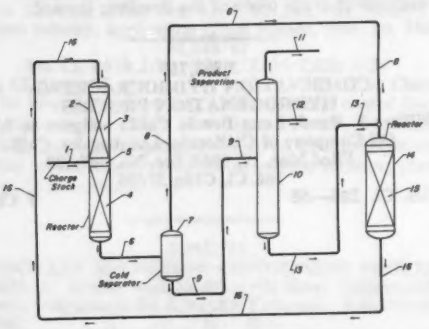
An advantageous hydrogen supply system is disclosed for the hydrogenation of certain undesirably aromatic product fractions derived from hydrocracking systems, whereby essentially the same equipment and power required to supply makeup hydrogen to the hydrocracking system is used to circulate hydrogen once-through the post-hydrogenation system, thereby eliminating the need for separate makeup and recycle gas compressors for the latter. Due to the relatively high chemical hydrogen consumption in the hydrocracking system, and the relatively low feed rate and mild conditions in the hydrogenation

system, it is found that the multi-stage makeup gas compressor required for the hydrocracking system can be advantageously utilized to move the makeup hydrogen required for the hydrocracker first through the hydrogenation system, and that such makeup hydrogen is fortuitously sufficient to operate the hydrogenation system in once-through fashion, i.e. without recycle.

3,592,758
HYDROGENATION OF AROMATIC HYDROCARBONS
Texas V. Inwood, La Habra, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
No Drawing. Filed Feb. 5, 1969, Ser. No. 796,895
Int. Cl. C10g *23/04*
U.S. Cl. 208—89 **10 Claims**

Aromatic hydrocarbon feedstocks containing organic sulfur compounds are hydrogenated in a "single-stage" process, utilizing a dual-catalyst hydrogenation system. The feed is first hydrofined over a sulfactive catalyst selective for the hydrodecomposition of organic sulfur compounds, and total effluent is then hydrogenated over a sulfur-sensitive Group VIII noble metal hydrogenation catalyst active for the hydrogenation of aromatic hydrocarbons.

3,592,759
MULTIPLE STAGE HYDROCRACKING PROCESS
Ernest L. Pollitzer, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Apr. 18, 1969, Ser. No. 817,533
Int. Cl. C10g *23/00*
U.S. Cl. 208—89 **6 Claims**



A sulfurous charge stock, containing nitrogenous compounds and aromatic hydrocarbons, is converted into lower-boiling hydrocarbon products of predetermined end boiling points. The charge stock, in admixture with a previously hydrocracked, substantially desulfurized stream, is subjected to a clean-up operation at relatively low operating severities for the removal of nitrogenous compounds without incurring the formation of appreciable quantities of polynuclear aromatics. Following separation, a portion of the substantially nitrogen-free product is then subjected to hydrocracking without incurring rapid catalyst deactivation normally resulting from the presence of condensed ring, polynuclear aromatics.

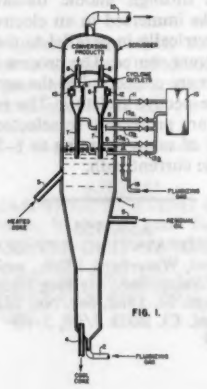
3,592,760
CATALYTIC HYDROCRACKING
Dean Arthur Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
No Drawing. Filed Sept. 20, 1967, Ser. No. 669,289
Int. Cl. B01j *11/40*; C10g *11/02*
U.S. Cl. 208—111 **27 Claims**

A hydrocracking catalyst comprising a crystalline zeolite containing titanium or a compound thereof and a hydrogenation component such as a Group V, VI or VIII metal, oxide or sulfide and the use of such catalyst in a hydrocracking process.

3,592,761
ASPHALTENE HYDROCONVERSION PROCESS
Edward L. Cole, Fishkill, and Edwin C. Knowles, Poughkeepsie, N.Y., assignors to Texaco Inc., New York, N.Y.
No Drawing. Filed Apr. 14, 1969, Ser. No. 816,105
Int. Cl. C10g *13/02*
U.S. Cl. 208—108 **11 Claims**

An asphaltene hydroconversion process for the conversion of asphaltenes to lower boiling hydrocarbons by contacting said asphaltenes with hydrogen in the presence of a solid polymer prepared by interacting an aromatic polycarboxylic acid anhydride or halide producing compound with a polynuclear aromatic compound.

3,592,762
METHOD FOR DETECTING COKE BUILD-UP IN FLUID COKER OUTLETS AND METHOD FOR REMOVING SAID COKE
Don E. Blaser, Dover, N.J., and William E. Heck, Bakersfield, Calif.; said Heck assignor to The Signal Companies, Inc., said Blaser assignor to Esso Research and Engineering Company
Filed July 16, 1969, Ser. No. 842,211
Int. Cl. C10g *9/32*
U.S. Cl. 208—127 **7 Claims**

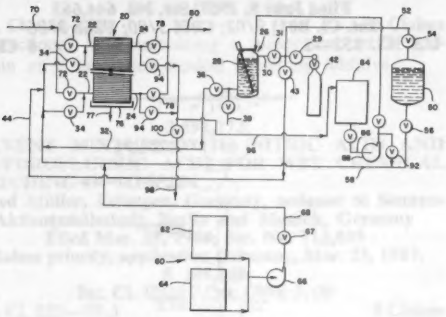


Coke build up in a cyclone outlet in a fluid coking process is detected by measuring the pressure differential between the inlet to the cyclone and the dipleg of the same cyclone. When the pressure differential thus measured exceeds a predetermined point, the instrumentation is cut off and a fluidizing gas is introduced to the dipleg to increase coke flow through the cyclone outlet and scour off the coke deposited thereon.

3,592,763
DYNAMICALLY FORMED, REVERSE OSMOSIS MEMBRANES
Marshall P. Tulin, Bethesda, Md., assignor to Hydronautics, Incorporated, Laurel, Md.
Filed Feb. 21, 1968, Ser. No. 707,258
Int. Cl. B01d *13/00*
U.S. Cl. 210—23 **8 Claims**

Tubular membranes are hydrodynamically formed within a porous tubular support to form a porous structure, and saline water is supplied under pressure to the

interior of the resulting structure to recover water having a low salt concentration outside of the tubular support. When it becomes necessary to replace the tubular membrane, the supply of saline water is discontinued and



a solvent is forced axially along the tubular membrane to dissolve it. Subsequently, the tubular membrane is hydrodynamically regenerated and the reverse-osmosis operation can be resumed.

3,592,764

METHOD OF AND COMPOSITION FOR THE TREATMENT OF SCALE

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed June 24, 1968, Ser. No. 739,206
Int. Cl. C02b 5/06
U.S. Cl. 210—58 **6 Claims**

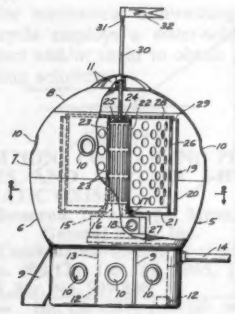
Method of and composition for the treatment of scale, particularly calcium sulfate scale, using a 1-alkylpyridium compound containing 5 to 20 carbon atoms in the alkyl portion, the corresponding water soluble salts and mixtures.

3,592,765

AQUARIUM FILTER

Juan E. Rodriguez, 37 Crest Road, New Hyde Park, N.Y. 11040

Filed Aug. 4, 1969, Ser. No. 847,365
Int. Cl. E04h 3/20
U.S. Cl. 210—169 **9 Claims**



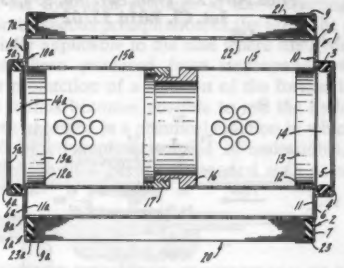
This invention is directed to an aquarium filter that includes a plural section outer shell in which the sections are readily separable, a submersible electric motor and pump positioned in the shell base, and a readily removable filter cartridge unit supported by the pump. Adaptors are provided for vacuum cleaning the interior of an associated aquarium tank, or for emptying the tank or for discharging the filtered water as a fountain into the tank. The water may be aerated during its passage through the unit.

3,592,766

SEPARABLE FILTER ELEMENT ASSEMBLY

Walter J. Kudlaty, Elmhurst, Ill., assignor to Marvel Engineering Company, Chicago, Ill.

Continuation of application Ser. No. 868,652, Oct. 22, 1969, which is a continuation of application Ser. No. 704,641, Feb. 12, 1968, both now abandoned. This application May 6, 1970, Ser. No. 35,298
Int. Cl. B01d 27/06
U.S. Cl. 210—232 **6 Claims**



A filter element assembly including a pleated filter media having an apertured tubular backing wall, a pair of end caps for the opposite ends of the filter media, each end cap carrying a tubular core portion of perforated metal and means for joining said core portions at their inner ends to secure said caps to each other. The joining means permit the length of the core to be varied to accommodate filter media of varying lengths.

3,592,767

LAMINATED FILTER SHEETS AND FILTER ELEMENTS AND PROCESS FOR MAKING THE SAME

David B. Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of application Ser. No. 616,028, Feb. 14, 1967. This application Apr. 23, 1970, Ser. No. 31,104
Int. Cl. B01d 39/16
U.S. Cl. 210—490 **30 Claims**

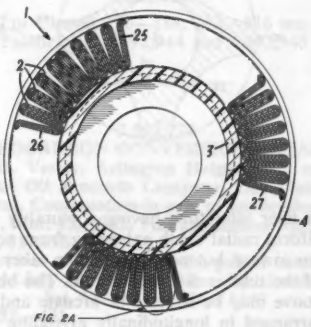


FIG. 2A

Laminated filter sheets, a process for making them and filter elements made of such laminated filter sheets are provided. A composite of a microporous filtering ply, and

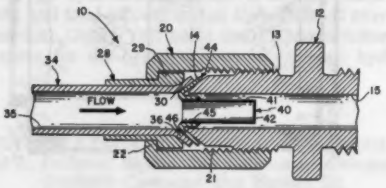
a reinforcing ply comprising a thin porous sheet composed at least in part of potentially adhesive fabric is subjected to pressure under conditions potentiating the adhesive of the reinforcing ply to effect a bond between the fabric and the surface of the filtering ply in contact therewith without substantially decreasing the porosity of the filtering ply. The resulting filter sheet or element can be fitted with end caps for supporting the filter sheet in a housing for the filtration of fluid.

3,592,768

FLARED TUBE STRAINER

Otis J. Parker, Chesapeake, Va., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Nov. 23, 1966, Ser. No. 596,733
Int. Cl. B01d *35/02*
U.S. Cl. 210—445 **1 Claim**



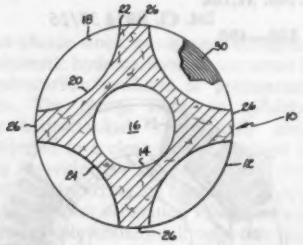
A strainer for a flared tube fitting. The strainer has a filtering portion which fits within the tube. A fitting is secured to the filtering portion and is flared to match the tube flaring. The flared portion of the fitting is clamped between the tube and a connector positioning and fixing the strainer in the tube.

3,592,769

GROOVED REPLACEABLE FILTER TUBE

Milton Richard Decker, Manhattan Beach, Calif., assignor to Johns-Manville Corporation, New York, N.Y.

Continuation of application Ser. No. 695,019, Jan. 2, 1968. This application Feb. 16, 1970, Ser. No. 10,099
Int. Cl. B01d *29/32*
U.S. Cl. 210—491 **17 Claims**



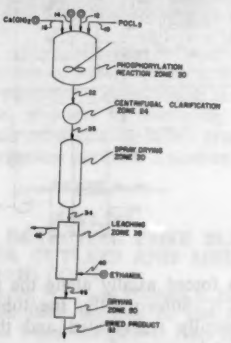
A glass fiber filter tube having a plurality of grooves of nonuniform radial depth extending from one cylindrical surface toward but not through the other cylindrical surface of the tube is disclosed herein. The bottom walls of the groove may be straight or arcuate and their ends may be arranged in longitudinally extending rows separated by imperforate portions of one tube wall surface, and each row contains a plurality of such grooves separated by lands. The filter is a replaceable unit useful for removing solids and immiscible liquids from a fluid stream.

3,592,770

PROCESS FOR RECOVERING COMPOSITIONS CONTAINING CALCIUM SUGAR PHOSPHATES AND INORGANIC PHOSPHATE

John Lambiris, New York, N.Y., assignor to The Colonial Sugar Refining Limited, Sydney, New South Wales, Australia

Filed June 8, 1967, Ser. No. 644,663
Int. Cl. B01j *9/02*; C05f *5/00*; F26b *3/06*
U.S. Cl. 252—1 **6 Claims**



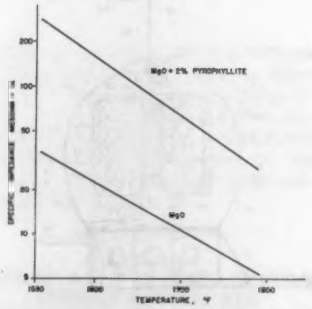
A process for recovering compositions of matter containing calcium sucrose phosphates and inorganic phosphate which comprises phosphorylating sucrose in the presence of lime to obtain a reaction effluent containing calcium sucrose phosphate, inorganic phosphates, calcium chloride, and sucrose, spray drying the reaction effluent to obtaining a porous, finely divided, free-flowing material contain about 10% moisture, and leaching the spray-dried product with 80% ethanol to obtain a product having a chloride content less than about 0.5% and a ratio of organic phosphorus to inorganic phosphorus of about 2:1.

3,592,771

TUBULAR HEATING ELEMENTS AND MAGNESIA INSULATION THEREFOR AND METHOD OF PRODUCTION

Willem Vedder, Latham, N.Y., and John Schultz, Jr., Louisville, Ky., assignors to General Electric Company

Original application Feb. 1, 1968, Ser. No. 702,474, now Patent No. 3,477,058, dated Nov. 4, 1969. Divided and this application Feb. 24, 1969, Ser. No. 829,818
Int. Cl. H01b *3/02, 3/10*
U.S. Cl. 252—63.2 **7 Claims**



Compacted, granular, fused magnesia used as thermally-conducting electrical insulating in tubular, electrical resistance elements is substantially improved both in compaction density and electrical resistivity through the addition of 0.1 to 5.0 percent of any of a variety of substances of layer-structure crystal form such as pyrophyllites.

3,592,772

FUNCTIONAL FLUIDS CONTAINING AMMONIA FOR PREVENTING CAVITATION DAMAGE

Douglas Godfrey, San Rafael, Robert L. Peeler, Albany, and Neal W. Furby, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Feb. 28, 1968, Ser. No. 708,755
Int. Cl. C09k *3/00*
U.S. Cl. 252—78 10 Claims

Functional fluid containing a minor amount of ammonia as a cavitation-erosion inhibiting additive.

3,592,773

SOLVENT MIXTURE WITH NITRIC ACID AND HYDROFLUORIC ACID FOR WET CHEMICAL ETCHING OF SILICON

Alfred Müller, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 25, 1968, Ser. No. 715,805
Claims priority, application Germany, Mar. 23, 1967, S 108,980
Int. Cl. H01l *7/50;* C09k *3/00*
U.S. Cl. 252—79.3 9 Claims

Described is a solvent mixture of nitric acid and hydrofluoric acid for wet chemical etching of silicon objects. The solvent mixture is characterized by the incorporation of at least one addition to the mixture. This addition reacts with nitrous acid and with nitrogen oxides present through the chemical equilibrium of nitrous acid with nitrogen oxide. The additions are primary or secondary aliphatic or aromatic amines, simple and N-substituted acid amides, hydrazine and hydroxylamine, their derivatives and salts and S—N compounds which contain =NH or —NH_2 groups. Illustratory additions are carbamide, cyclohexylamine, gelatine and hydrazine.

3,592,774

NOVEL RINSING AGENTS

Theodor Altenschöpfer, Dusseldorf-Wersten, Germany, assignor to Henkel & Cie., G.m.b.H., Dusseldorf-Holthausen, Germany

No Drawing. Filed May 3, 1968, Ser. No. 726,551
Int. Cl. C11d
U.S. Cl. 252—89 10 Claims

A process for mechanical dishwashing in which the clear rinsing cycle employs a water-soluble starch degradation product and/or sugar to obtain spot-free dishes and novel rinsing solutions.

3,592,775

COMPOSITIONS CONTAINING PHENOLIC OXIMES AND CERTAIN α-HYDROXY ALIPHATIC OXIMES

Ronald R. Swanson, New Hope, Minn., assignor to General Mills, Inc.

No Drawing. Continuation-in-part of abandoned application Ser. No. 498,121, Oct. 19, 1965. This application Mar. 1, 1968, Ser. No. 709,800
Int. Cl. C07c *131/00*
U.S. Cl. 252—182 9 Claims

Saturated aliphatic, ethylenically unsaturated aliphatic and saturated or ethylenically unsaturated aliphatic ether substituted 2-hydroxy benzophenoximes containing a total of from 3–25 carbon atoms in the aliphatic groups. Compositions comprised of such benzophenoximes and certain α-hydroxy aliphatic oximes. Compounds and compositions are useful for the extraction of metal values.

3,592,776

PRODUCTION OF HYDROGEN PEROXIDE

John Vincent Fletcher, Knutsford, and Dennis Martin, Cheadle Hulme, England, assignors to Burmah Oil Trading Limited, London, England

Filed Apr. 7, 1969, Ser. No. 813,907
Claims priority, application Great Britain, Apr. 5, 1968, 16,578/68
Int. Cl. C01b *15/02*
U.S. Cl. 252—186 9 Claims

Hydrogen peroxide dissolved, e.g., in a secondary alcohol such as isopropanol is transferred from that solvent to another solvent by precipitating the hydrogen peroxide from its solution with urea, and mixing the resulting urea/hydrogen peroxide adduct with an extracting solvent constituted by a lower alkyl ketone, a lower alkyl ester or a lower alkyl ortho-phosphate, which mixing leads to dissolution of the hydrogen peroxide in the extracting solvent with simultaneous precipitation of the urea; the process is especially applicable to the case where the hydrogen peroxide has been produced from isopropanol—which leads to the production of a solution of the former in the latter—and it thus becomes possible to use the hydrogen peroxide thus obtained in a chemical reaction in which the presence of isopropanol as solvent is undesirable, e.g. in the production of a peroxy compound such as a percarboxylic acid.

3,592,777

FLUORESCENCE EXHIBITING POLYMER BLENDS

John W. Bayer, Toledo, Ohio, assignor to Owens-Illinois, Inc.

No Drawing. Division of applications Ser. No. 791,523, Jan. 15, 1969, now Patent No. 3,506,613, and Ser. No. 472,058, July 14, 1965. This application Mar. 13, 1969, Ser. No. 807,078
Int. Cl. C09k *1/02*
U.S. Cl. 252—301.2R 10 Claims

There is disclosed the preparation of novel polymer blends that exhibit fluorescence when subjected to selected activation energy. The preparation comprises reacting an aliphatic or aromatic substituted aliphatic diketone and an aliphatic diamine such that there results a linear, non-cross-conjugated polymer exhibiting fluorescence under appropriate energy excitation, said polymer having no chromophore groups in its structure which will internally absorb the fluorescence emission of the polymer, and then blending said prepared polymer with another polymer in an amount sufficient to impart fluorescence to the resulting blend.

ERRATA

For Classes 252—188, 252—316 see:
Patent Nos. 3,592,944 and 3,592,945

3,592,778

HYDROCARBON CONVERSION CATALYST

Kenneth D. Vesely, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 622,403, Mar. 13, 1967. This application Apr. 24, 1969, Ser. No. 819,095
The portion of the term of the patent subsequent to July 22, 1986, has been disclaimed
Int. Cl. B01j *11/36, 11/40*
U.S. Cl. 252—451 6 Claims

A catalytic composite comprising a faujasite dispersed in an amorphous silica matrix. The catalyst is manufactured by adding the faujasite together with the mother liquor from which it was precipitated to a silica sol and then effecting gelation.

3,592,779

ACID SLUDGE AS BINDER FOR THE PRODUCTION OF SHAPED CARBONACEOUS ARTICLES AND ACTIVATION THEREOF

Oliver A. Kiikka, Willoughby, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

No Drawing. Filed Nov. 6, 1968, Ser. No. 773,966
Int. Cl. C01b *31/08*
U.S. Cl. 252—421 4 Claims

Acid sludge formed by the reaction of a mineral acid with a relatively high molecular weight hydrocarbon is used to bind various particulate carbon materials into shaped articles which may be activated. The carbon materials useful in this invention are materials such as coke, coal, wood charcoal or any form of carbon produced by charring or destructive distillation of wood, peat, lignite, nut shells, corn cobs, bones, vegetable matter generally, natural and synthetic organic polymers, or other carbonaceous matter, including liquid and liquefiable petroleum fractions. The carbon content of materials used for admixing with the acid sludge ranges from about 10 percent for bone charcoal to 98 percent or higher for some wood chars. The approximate bulk density of useful carbon materials ranges from 0.08 to 2.50.

3,592,780

PRETREATMENT OF PLATINUM REFORMING CATALYST

Jay A. Rashkin, Piscataway, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.

No Drawing. Filed Dec. 29, 1969, Ser. No. 888,950
Int. Cl. B01j *11/74*
U.S. Cl. 252—439 6 Claims

Fresh platinum reforming catalyst is pretreated by initially contacting the catalyst with hydrogen and reforming naphtha containing at least about 200 parts per million sulfur at a temperature between about 700 and about 750° F., a pressure between about 200 and about 600 p.s.i.g. and a space velocity between about 1 and about 3 w./w./hr. The temperature is then raised to between about 800 and about 850° F. over a period between about 2 and about 7 hours after which the flow naphtha is discontinued and the catalyst is contacted with inert gas (preferably nitrogen) at a temperature between about 800 and about 850° F., and a pressure between about 25 and about 150 p.s.i.g. for a time between about 8 and about 24 hours. The catalyst is then again contacted with sulfur-containing reforming naphtha under the same pressure and space velocity conditions as before and the temperature is gradually raised to the range of between about 890 and about 940° F. over a period of between 2 and about 7 hours, at the end of which time the catalyst is again subjected to contact with inert gas for an additional period of between about 8 and about 24 hours. Following the final inert gas soak, the catalyst is ready for use in reforming naphtha of low sulfur content in a conventional manner.

3,592,781

CONDUCTIVE GLAZE COMPOSITION AND METHOD FOR PREPARATION

Gerald P. Wirtz, Urbana, Ill., and Robert M. King, Lewiston, N.Y., assignors to Air Reduction Company, Incorporated, New York, N.Y.

No Drawing. Filed Feb. 18, 1969, Ser. No. 800,276
Int. Cl. H01b *1/02;* B44b *1/02*
U.S. Cl. 252—514 7 Claims

An electroconductive glaze composition comprising a homogeneous mixture of approximately 85 to 95% by weight particulate metals, dispersed in an at least partially devitrified glass matrix, said metals preferably comprising approximately 5 to 20% by weight cadmium, and balance silver.

3,592,782

LATENT FOAMING COMPOSITION AND METHOD FOR THE PREPARATION THEREOF

Christian A. Weber, Sanford, and Donald H. Clarke, Essexville, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Nov. 29, 1968, Ser. No. 780,213
Int. Cl. C08f *27/12, 45/30, 47/10*
U.S. Cl. 260—2.5 10 Claims

Expandable microspheres incorporated in latent foaming polyhalostyrene compositions provides a fine-celled foam product.

3,592,783

POROUS POLY(ARYLENE SULFIDE) COMPOSITIONS AND METHOD FOR PRODUCING SAME

James T. Edmonds, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Apr. 9, 1969, Ser. No. 814,826
Int. Cl. C08g *51/04, 53/08*
U.S. Cl. 260—2.5 6 Claims

Porous compositions of a poly(arylene sulfide) polymer and a particulate heat resistant material which are suitable for forming into bearings or other articles of manufacture are prepared by (a) forming a slurry of a poly(arylene sulfide) polymer having a particle size of 1 to 3500 microns with a particulate heat resistant compound such as asbestos having a particle size of 1 to 3500 microns in a volatilizable liquid, (b) compressing the resulting slurry so as to form an integral molded composition having from 0.1 to 70 weight percent residual volatilizable liquid therein, (c) heating the resulting composition at a first temperature in the range of 0° C. to 230° C. so as to substantially volatilize the residual liquid therein, (d) thereafter additionally heating the resulting composition at a second temperature in the range of 250 to 500° C., and (e) thereafter recovering the resulting porous, filled poly (arylene sulfide) composition as a product of the process.

3,592,784

CROSS-LINKABLE POLYMER COMPOSITIONS

Karl Brack, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Aug. 3, 1967, Ser. No. 658,060
Int. Cl. C08f *47/10;* C08g *53/10*
U.S. Cl. 260—2.5 2 Claims

A cross-linkable polymer composition is obtained by admixing an unsaturated polymer, a polyfunctional hydrazide halide of a specified formula, and material that provides upon contact with water at least one alkaline reactant that reacts with the hydrazide halide to form the corresponding polyfunctional nitrile imine which in turn cross-links the unsaturated polymer.

3,592,785

METHOD OF MAKING POLYETHYLENE FOAM

William A. Patterson, Spartanburg, S.C., Stanley Norman Weissman, Cedar Grove, N.J., and Henry G. Schirmer, Spartanburg, S.C., assignors to W. R. Grace & Co., Duncan, S.C.

No Drawing. Continuation of application Ser. No. 307,340, Sept. 9, 1963, now Patent No. 3,432,447. This application Dec. 5, 1968, Ser. No. 781,599
Int. Cl. C08f *3/04, 29/04, 47/10*
U.S. Cl. 260—2.5R 5 Claims

A process for preparing polyethylene foam consisting essentially of forming a mixture of solid polyethylene and normally solid, heat decomposable organic foaming agent having a decomposition temperature at least about 10° C. above the melting point of the polyethylene material; subjecting said admixture to high energy ionizing radiation to produce a percent gel of about 30 to about 80; heating the irradiated body in stages, first at a temperature slightly below the decomposition point of the

foaming agent and immediately thereafter rapidly heating to a temperature well above the decomposition point to form an expanded body and cooling the heated body to a temperature below the freezing point of the polyethylene.

3,592,786

COMPOSITION FOR MAKING SOIL RELEASING, DURABLE PRESS FABRICS

Ronald Swidler, Pasadena, Calif., Ray S. Smith, Greensboro, N.C., and Harry A. Miller, Altavista, Va., assignors to Burlington Industries, Inc., Greensboro, N.C.

No Drawing. Application Nov. 15, 1967, Ser. No. 683,139, now Patent No. 3,521,993, dated July 28, 1970, which is a continuation-in-part of application Ser. No. 645,599, June 13, 1967. Divided and this application May 26, 1970, Ser. No. 40,717

Int. Cl. C08f *45/36;* D06c *29/00*

U.S. Cl. 260—21 4 Claims

A composition for treatment of textiles to impart durable press and soil release properties. The composition comprises an aryl stearic acid, an aminoplast pre-condensate or other durable press reactant and a synthetic polymer which absorbs at least about five times its weight of water under alkaline conditions. Preferably the materials are dispersed in aqueous medium.

3,592,787

URETHANE ELASTOMERS

Janis Robins, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of applications Ser. No. 41,153, July 6, 1960, Ser. No. 199,644, June 4, 1962, and Ser. No. 537,015, Mar. 24, 1966. This application Mar. 28, 1969, Ser. No. 811,593

Int. Cl. C08g *22/40*

U.S. Cl. 260—18 2 Claims

A process is provided for making a cross-linked polyurethane rubber by forming a liquid reaction mixture of a liquid polymeric polyol reactant having dissolved therein a catalytic amount of a mercuric salt of a carboxylic acid containing from 2 to 18 carbon atoms e.g. mercuric octoate, napthenate, stearate or oleate, and an organic polyisocyanate reactant, at least one of these reactants includes a polyfunctional component for cross-linking having more than two functional groups selected from the group consisting of —NCO and —OH radicals. The reactants mentioned above have an approximately stoichiometric equivalence of —NCO and —OH radicals. The mixture is reacted until substantially all the reactive —NCO and —OH groups have interreacted with one another. This interreaction converts the mixture to a solid non-cellular cross-linked polyurethane rubber substantially free of further reactive groups.

This invention is also directed to a composition capable of reaction with a polyisocyanate to effect a rapid cure of the same. This composition comprises a liquid organic polyol having a minor amount of said mercuric salt dissolved therein.

3,592,788

EMULSIONS AND THEIR USE IN SOIL TREATMENT

Fritz S. Rostler, Berkeley, Calif., assignor to Phillips Petroleum Company, Bartlesville, Okla.

No Drawing. Filed Dec. 14, 1967, Ser. No. 691,116

Int. Cl. C08f *45/52, 45/44*

U.S. Cl. 260—28.5 4 Claims

An emulsion concentrate (1) containing a thermoplastic elastomer of the styrene-butadiene block copolymer type which is soluble in trichlorethylene to give a viscosity of about 800 to 1,000 centipoises at room temperature at a polymer concentration of 15% by weight, and having a modulus at 300% of 200 p.s.i. or higher, a coumarone-indene resin, a polar solvent which is an unsaturated resinous oil that is nonvolatile under atmospheric conditions, a chlorinated hydrocarbon solvent which is volatile under atmospheric conditions, a non-polar solvent of the aromatic hydrocarbon type which is volatile under atmospheric conditions, a cationic emulsifier and water. An emulsion concentrate (2) containing from about 40 to 60 parts of an asphalt of about 10 to 30 penetration grade; a non-polar solvent of the aromatic hydrocarbon type which is volatile under atmospheric conditions; a chlorinated hydrocarbon solvent which is volatile under atmospheric conditions, a cationic surfactant, and water. Method of treating soils with an aqueous emulsion containing a mixture of concentrates (1) and (2) or consecutively with an emulsion containing concentrate (1) and also with an emulsion containing concentrate (2) or vice versa.

3,592,789

PROCESS FOR PREPARING POLYMER SOLUTION FROM AROMATIC ANHYDRIDES AND ISOCYANATES

Benjamin A. Bolton, Chesterton, Ind., assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Feb. 7, 1968, Ser. No. 703,557

Int. Cl. C08g *51/44, 51/48*

U.S. Cl. 260—30.8 3 Claims

This invention relates to the production of insulating and protective coatings for electric wire and other surfaces. More particularly it relates to the preparation of coating solutions wherein aromatic anhydrides and polyisocyanate are dissolved in a polar solvent boiling above 300° F. at a temperature of about 150° to 300° F. The coating solution is then cooled to room temperature and the resulting solution is applied to metal surfaces and baked to adherent, tough films useful as electrical and missile coatings.

3,592,790

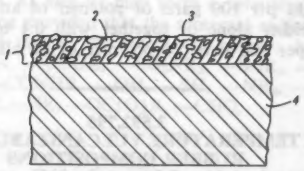
COATING COMPOSITION AND METHOD OF COATING ARTICLES THEREWITH

Lloyd T. Flanner, Florham Park, and Paul D. Dernier, Stirling, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed June 27, 1968, Ser. No. 740,764

Int. Cl. C08f *37/18;* C08g *51/24*

U.S. Cl. 260—33.6 17 Claims



Disclosed are aerosol spray compositions suitable for home application of non-stick coatings to food processing utensils, comprising finely divided granular polytetrafluoroethylene, methylphenyl silicon resin binder, and a solvent-propellant carrier mix, and a method of coating food processing utensils with these compositions, which method comprises the steps of first spray coating the utensils with these compositions, and then baking the spray coat to form a hard abrasion resistant non-stick surface.

3,592,791
COLORATION PROCESS
Peter William Barker, Albert Charles Cooper, and Francis Irving, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Nov. 13, 1967, Ser. No. 682,502
Claims priority, application Great Britain, Nov. 23, 1966, 52,466/66
Int. Cl. C08g 51/14
U.S. Cl. 260—37 4 Claims

Mass-coloration of polyamides with copper phthalocyanines containing from 1 to 4 carboxylic acid or carboxylic acid amide groups.

3,592,792
AGRICULTURAL PLASTIC FILM
Gordon C. Newland, Roger M. Schulken, Jr., and Raymond C. Harris, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed July 24, 1968, Ser. No. 747,076
Int. Cl. A01g 7/00; C08f 45/66
U.S. Cl. 260—41 9 Claims

Poly-α-olefin films for use as agricultural ground cover can be made heat absorbent to assist in plant development while preventing weed growth, and thereafter heat reflective to give increased crop production, and thereafter friable, by the incorporating into the film composition certain fugitive heat absorptive colorants, light reflective opaquing pigments, and pro-oxidants.

3,592,793
SCORCH RETARDANT
Edwin J. Latos, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed July 10, 1969, Ser. No. 840,821
Int. Cl. C08c 11/12, 11/46; C08d 11/04
U.S. Cl. 260—41.5 10 Claims

Retarding scorch in a curable rubber composition containing a phenylenediamine antiozonant by incorporating calcium silicate therein.

3,592,794
STABILIZED CONJUGATED DIENE POLYMERS AND COPOLYMERS
William O. Drake and Clive D. Moon, Bartlesville, Okla., assignors to Phillips Petroleum Company
No Drawing. Filed Oct. 24, 1968, Ser. No. 770,419
Int. Cl. C08d 7/10; C08g 5/54
U.S. Cl. 260—45.9 9 Claims

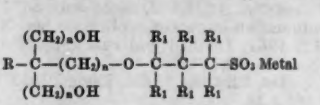
Conjugated diene polymers are stabilized to minimize, melt flow decrease at elevated temperatures by admixing the polymer of the conjugated diene with 0.1 to 10 parts by weight per 100 parts of polymer of an alkali metal nitrite either alone or together with 0.1 to 5 parts by weight per 100 parts of polymer of an alkali metal bisulfite.

3,592,795
ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER COMPOSITIONS
Bruce A. Ashby, Schenectady, N.Y., assignor to General Electric Company
No Drawing. Continuation-in-part of abandoned application Ser. No. 482,943, Aug. 26, 1965. This application Apr. 10, 1969, Ser. No. 815,206
The portion of the term of the patent subsequent to Oct. 29, 1985, has been disclaimed
Int. Cl. C08g 47/10
U.S. Cl. 260—46.5 16 Claims

Compositions vulcanizable at room temperature comprising an organic polymer such as a polyether or polyester having terminal organosilyl radicals with aminoxy radicals attached to silicon. These curable compositions can be employed as sealants and caulking compounds.

3,592,796
LINEAR POLYESTER POLYMERS CONTAINING ALKALI METAL SALTS OF SULFONATED ALIPHATIC COMPOUNDS
Louis E. Trapasso, Westfield, and Robert W. Stackman, Morris Township, Morris County, N.J., assignors to Celanese Corporation of America, New York, N.Y.
No Drawing. Continuation of application Ser. No. 502,520, Oct. 22, 1965. This application Mar. 10, 1969, Ser. No. 809,468
Int. Cl. C08g 39/04, 53/14
U.S. Cl. 260—75 4 Claims

A mixture of a linear terephthalate polyester polymer and minor amounts of a metallized compound having the formula:



wherein

(a) R represents a member selected from the group consisting of hydrogen and an alkyl radical containing from 1 to 6 carbon atoms,
(b) R_1, individually, represents a member selected from the group consisting of hydrogen and an alkyl radical containing from 1 to 6 carbon atoms, and
(c) each *n* represents an integer from 0 to 3.

3,592,797
CLEAR, VIRTUALLY COLORLESS POLYETHYLENE TEREPHTHALATE
William M. Dunbar, Village of Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Continuation-in-part of abandoned application Ser. No. 755,819, Aug. 28, 1968. This application June 9, 1969, Ser. No. 831,749
Int. Cl. C08g 17/04, 17/003
U.S. Cl. 260—75 5 Claims

Clear and virtually colorless resin such as is obtained by polymerizing dimethyl terephthalate or terephthalic acid and ethylene glycol with catalytic amounts of zinc acetate and trimethylolpropane. Biaxially oriented film of the polymer is likewise clear and virtually colorless and especially useful as a photographic film base.

3,592,798
PREPARATION OF POLYTHIOETHER ADDITION PRODUCTS
Alexis A. Oswald, Mountainside, N.J., assignor to Esso Research and Engineering Company
Filed Apr. 11, 1966, Ser. No. 541,696
Int. Cl. C08g 23/00
U.S. Cl. 260—79 12 Claims

Novel terminal difunctional polythioether polyadducts useful as mastic compositions are prepared by reacting dithiols with acetylenes under free radical conditions. Dependent on the thiol/acetylene ratio, the novel polymers contain thiol and/or vinyl sulfide end groups.

3,592,799
METHOD FOR THE MANUFACTURE OF SYNTHETIC ELASTOMERS AND PRODUCTS OBTAINED BY SUCH METHOD
Georges Rouzier, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements, Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, Puy-de-Dome, France
Filed Apr. 28, 1966, Ser. No. 546,022
Claims priority, application France, Apr. 29, 1965, 15,253
Int. Cl. C08f 15/04; C08d 1/20, 1/36
U.S. Cl. 260—83.7 14 Claims

A process for the preparation of polymers having a polymodal molecular weight distribution wherein a con-

jugated diene monomer compound is polymerized by means of an organic lithium polymerization catalyst and when a fraction of the monomer has polymerized then adding to the reaction medium an organic halide.

3,592,800

POLYMERIZATION OF VINYL CHLORIDE IN AQUEOUS SUSPENSION IN THE PRESENCE OF LOW VISCOSITY POLYVINYL ALCOHOL AND A PROTECTIVE COLLOID

Werner Oschmann, 148 Mundenheimer Strasse, 6700 Ludwigshafen, Germany; Richard Greger, 63 Kirchwaldstrasse, 6800 Mannheim, Germany; and Alfred Hauss, 7 Kranichstrasse; and Gernot Winter, 2 Gneisenaustrasse, both of 6700 Ludwigshafen, Germany

No Drawing. Filed Nov. 26, 1968, Ser. No. 779,217
Claims priority, application Germany, Nov. 29, 1967, P 17 20 328.0
Int. Cl. C08f *1/11, 3/30, 15/28*
U.S. Cl. 260—85.5 5 Claims

Process for polymerizing vinyl chloride in aqueous suspension in the presence of conventional high molecular weight protective colloids and a low molecular weight polyvinyl alcohol which improves the absorption of plasticizer without affecting the high electrical resistance.

3,592,801

FREE-FLOWING FUSED BEADS OF THERMOPLASTIC POLYMERS

Jerry D. Ilavsky and Richard W. Ford, Sarnia, Ontario, Canada, assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 12, 1968, Ser. No. 783,412
Int. Cl. C08f *15/04*; C08d *3/04, 5/02*
U.S. Cl. 260—88.2 14 Claims

Free-flowing fused beads of normally solid, thermoplastic organic polymers such as polyethylene are prepared by (1) suspending a fine powder of the thermoplastic polymer in an aqueous medium containing a small amount of a non-reactive, insoluble suspending agent such as zinc oxide, (2) heating the resulting suspension to a temperature at or above the melting point of the polymer while subjecting the suspension to agitation and (3) cooling the suspension under continued agitation.

3,592,802

POLYMERIZATION OF TETRAFLUOROETHYLENE

Lacey E. Scoggins and John E. Mahan, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,794
Int. Cl. C08f *3/24*
U.S. Cl. 260—92.1 10 Claims

Tetrafluoroethylene is polymerized in the presence of at least one di(saturated hydrocarbyl) peroxydicarbonate wherein the saturated hydrocarbyl radicals have from 1 to 4 carbon atoms.

3,592,803

MALONAMIDES AS ANTIPLASTICIZERS FOR POLYVINYL CHLORIDES

Clarence R. Bresson, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Apr. 9, 1969, Ser. No. 814,800
Int. Cl. C08f *29/18*
U.S. Cl. 260—92.8 7 Claims

2-aminomalonamides having a hydrocarbyl substituent on each of the three nitrogen atoms, for example, as in N,N'-dicyclohexyl-2 - (cyclohexylamino)malonamide, are used as processing aids and antiplasticizers for polymers of the poly(vinyl chloride) type.

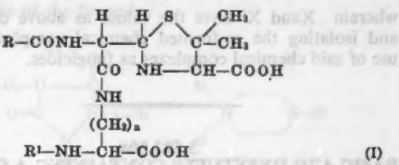
3,592,804

N-(SUBSTITUTED-α-PENICILLOYL)-DIAMINO CARBOXYLIC ACIDS

Peter Quitt, Basel, and Karl Vogler, Riehen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Nov. 19, 1968, Ser. No. 777,178
Claims priority, application Switzerland, Jan. 4, 1968, 88/68
Int. Cl. A61k *27/00*; C07c *103/52*; C07d *91/18*
U.S. Cl. 260—112.5 10 Claims

Penicilloic acid derivatives of the formula



(I)

wherein *n* is an integer from 2 to 4 and R in preferred embodiments is benzyl, phenoxymethyl or allylthiomethyl and R_1 is hydrogen or lower acyl and methods for their preparation are disclosed. These penicilloic acid derivatives are useful for inhibiting allergic reactions which occur on administration of penicillins.

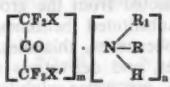
3,592,805

COMPLEX OF ORGANIC AMINE WITH A COMPLETELY HALOGENATED ACETONE AND METHOD OF PREPARATION

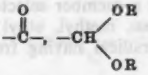
Karoly Szabo, Pleasantville, N.Y., and Ashley H. Freiberg, Santa Clara, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Continuation of application Ser. No. 308,632, Sept. 13, 1963, which is a continuation-in-part of application Ser. No. 221,456, Sept. 5, 1962. This application Feb. 17, 1969, Ser. No. 802,740
Int. Cl. A01n *9/16, 9/20, 9/22*
U.S. Cl. 260—140 2 Claims

A chemical complex of the following formula:



wherein R_1 and R_2 are hydrogen: an alkyl radical of from 1 to 18 carbon atoms; an alkyl radical of from 1 to 18 carbon atoms; an alkynyl radical of from 1 to 9 carbon atoms; a non-aromatic carbocyclic radical of from 5 to 6 carbon atoms; an aralkyl radical wherein the alkyl portion is lower alkyl and the aryl portion is a phenyl or naphthyl radical; phenyl radical; naphthyl radical; an amino radical; cyano or a heterocyclic radical; and when taken together R_1 and R_2 may form a heterocyclic ring system; it being provided that the aforesaid radicals may have attached thereto the functional moiety: halogen, —CN, —SCN, —COOR, $—SO_2NR_2$, —SOR, $—SO_2R$, $—CONR_2$, —CONHR, —OH, —SH, $—NR_2$, —NHR, $—NH_2$, —OR, —SR, —OC(O)R, —CHO,



$—NO_2$ and —N=N, wherein R can be an organic radical of the type above defined for R_1 and R_2; X and X' are fluorine or chlorine, and *n* and *m* are integers of from 1 to 3 with the proviso that *n* and *m* are identical when equal to unity; and a method for preparing said chemical complex by reacting 1 to 2 moles of an organic amine of the formula

wherein R_1 and R_2 have the values as above designated, with 1 to 2 moles of a fully halogenated acetone of the formula

wherein Xand X' have the values as above designated, and isolating the so-formed chemical complex and the use of said chemical complexes as fungicides.

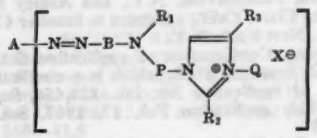
3,592,806

BASIC AZO DYESTUFFS CONTAINING A QUATERNIZED N-ALKYL-N - β-(IMIDAZOLYL) LOWER ALKYLARYLAMINE GROUP

Masao Iizuka, Kyokuji Arakawa, and Yoshiaki Yamamoto, Tokyo, Japan, assignors to Hodogaya Kagaku Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Dec. 12, 1967, Ser. No. 689,780
Claims priority, application Japan, Dec. 19, 1966, 41/82,738
Int. Cl. C09b *29/36, 62/82*; D06p *1/02*
U.S. Cl. 260—157 **14 Claims**

A basic dyestuff of the formula:



wherein:

A is a residue selected from the group consisting of substituted and unsubstituted benzenes, diphenyls, diphenylmethanes, azobenzenes, thiazoles, benzothiazoles, thiadiozoles, triazoles, and derivatives thereof, wherein the substituents are non-water-solubilizing substituents selected from the group consisting of chlorine, bromine, nitrile, nitro, acetyl, trifluoromethyl, lower alkylsulphonyl, sulphonamide, mono- and di-lower alkylsulphonamide, lower alkoxycarbonyl, acetylamino, phenylamino, phenyl, lower alkyl and lower alkoxy;

B is a radical selected from the group consisting of substituted and unsubstituted phenylene and naphthylene radicals bonded to the azo and the amino groups in the 1- and 4-positions, wherein the substituents are non-water-solubilizing substituents selected from the group consisting of chlorine, methyl, methoxy and acetylamino;

R_1 is a member selected from the group consisting of lower alkyl having from 1 to 4 carbon atoms, β-cyanoethyl, β-hydroxyethyl and benzyl;

R_2 and R_3 each is a member selected from the group consisting of hydrogen, methyl, ethyl and phenyl;

P is an alkylene radical having from 2 to 3 carbon atoms;

Q is a member selected from the group consisting of lower alkyl, benzyl and carbamoylethyl;

X is an anion; and

n is 1 or 2.

The dyestuffs of the present invention are useful as dyes for a wide variety of materials, including tanned cellulosic fibers, silk, leather, cellulose acetate, paper, and synthetic fibers, especially polymeric and copolymeric acrylonitrile. The dyestuff of the present invention is particularly suitable for dyeing polyacrylonitrile fibers with excellent light, wet, and heat-fastness properties.

3,592,807

WATER-INSOLUBLE (N - CYANOLOWERALKYL-N-ACYLOXYLOWERALKYLAMINO) - PHENYLAZOBENZENE DYESTUFFS

Hanswilli von Brachel, Offenbach (Main), Dieter Cornelius, Seeheim, and Otto Gräwinger, Frankfurt am Main, Fechenheim, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main, Fechenheim, Germany

No Drawing. Filed Dec. 14, 1965, Ser. No. 513,828
Claims priority, application Germany, Dec. 24, 1964, C 34,750
Int. Cl. C07c *107/00*; C09b *29/08*; D06p *1/06*
U.S. Cl. 260—207.1 **3 Claims**

This invention relates to water-insoluble monoazo dyestuffs having a diazo coupled N-cyano-lower-alkyl, N-acyloxy-lower-alkyl aniline structure, which dyestuffs dye or print natural and synthetic fibers with good fastness properties.

3,592,808

METHOD OF PRODUCING D-XYLO-HEXOFURANURONO-6,3-LACTONE-5-ULOSE PROTECTED IN 1,2-POSITION

Olof Theander, Sandgrand, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,436
Claims priority, application Sweden, Dec. 22, 1967, 17,657/67
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 **4 Claims**

An improved method of preparing 1,2-O-isopropylidene-D-xylo-hexafuranurono-6,3-lactone-ulose from either 1,2-O-isopropylidene-α-D-glucofuranose or 1,2:5,6-bis-O-isopropylidene-α-D-glucofuranose by oxidizing with oxygen or an oxygen containing gas in the presence of a platinum catalyst at a pH below 6.

3,592,809

PROCESS FOR THE PRODUCTION OF LACTAMS

Otto Immel and Hermann Schnell, Krefeld-Uerdingen, and Hans-Helmut Schwarz, Krefeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 16, 1968, Ser. No. 721,580
Claims priority, application Germany, Apr. 25, 1967, F 52,235
Int. Cl. C07d *41/06*
U.S. Cl. 260—239.3 **8 Claims**

The invention relates to a process for the production of lactams by catalytical rearrangement of ketoximes in the gaseous phase, using as a catalyst system a mixture of boron trioxide or boric acid, highly dispersed carbon, and one or more additional inorganic supporting material, said highly dispersed carbon having a particle size of less than 0.1 mm. in diameter.

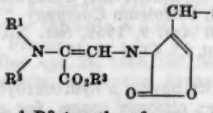
3,592,810

PROCESS FOR THE PREPARATION OF CEPHALOSPORIN C INTERMEDIATES

Joseph E. Dolfini, North Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed June 16, 1967, Ser. No. 646,484
Int. Cl. C07d *99/24*
U.S. Cl. 260—240 **5 Claims**

This invention relates to the chemical synthesis of cephalosporin C lactone by a process that utilizes a novel intermediate having the Formula I



(I)

wherein R^1 and R^2 together form a divalent acyl group derived from dicarboxylic acid; R^3 is alkyl, aryl, aralkyl; and R^4 is acyl, alkyl, or aralkyl; and the process of preparation thereof.

3,592,811

2-HEXAFLUOROISOPROPYLIDENE-1,3-THIAZETIDINES AND THE PREPARATION THEREOF

Maynard S. Raasch, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 9, 1967, Ser. No. 659,346
Int. Cl. C07d *85/04*
U.S. Cl. 260—240 10 Claims

Fluorinated thiazetidines having selected substituents are produced by the reaction of bis(trifluoromethyl)thioketene with a carbodiimide or an azine at moderate temperatures. These products are surface treating agents for making textiles water repellent.

3,592,812

7 - (1 - AMINOCYCLOALKYLCARBOXAMIDO) CEPHALOSPORANIC ACIDS AND RELATED COMPOUNDS

Harvey E. Alburn, West Chester, and William Dvonch, Chester, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Dec. 6, 1968, Ser. No. 782,005
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 5 Claims

Novel 7 - (1-aminocycloalkylcarboxamido)cephalosporanic acids, including aliphatic and aryl-cycloalkyl ring substituted cephalosporanic acids are prepared. The compounds have useful antibiotic activity.

3,592,813

3-PHENYL-9H-PYRIDAZINO[3,4-b]INDOLES

Kenneth G. Holden, Haddonfield, N.J., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Original application Apr. 18, 1967, Ser. No. 631,619, now Patent No. 3,519,592. Divided and this application Apr. 21, 1970, Ser. No. 30,579
Int. Cl. C07d *51/04*
U.S. Cl. 260—250 3 Claims

3-phenacylidene-2-oxoindoline-7-carboxylic acids and esters, prepared by converting 2,3-dioxoindoline-7-carboxylic acids to 3-hydroxy-3-phenacyl-2-oxo compounds and subsequent dehydration. The 3-phenacylidene compounds are reduced to the 3-phenacyl compounds and then ring-closed with hydrazine to give 3-phenylpyridazinoindoles. 2-oxoindoline-7-carboxylic acids are prepared by stepwise reduction of the 2-3-dioxo compounds. Certain of the compounds have antiinflammatory activity.

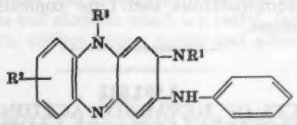
3,592,814

PHENAZINE DERIVATIVES

Vincent C. Barry, Joan Byrne, James G. Belton, and Michael L. Conalty, Dublin, Ireland, assignors to May & Baker Limited, Essex, England

No Drawing. Filed Sept. 12, 1968, Ser. No. 759,509
Claims priority, application Great Britain, Oct. 26, 1967, 48,797/67
Int. Cl. C07d *51/80*
U.S. Cl. 260—267 7 Claims

Phenazine derivatives of the formula:



wherein (a) R^1 represents isopropyl or phenyl, R^2 represents methoxy on position 8 of the phenazine nucleus, and R^3 represents phenyl, or (b) R^1 represents isopropyl or cyclohexyl, R^2 represents chlorine on position 8 of the phenazine nucleus, and R^3 represents phenyl, or (c) R^1 represents phenyl, R^2 represents methoxy on position 7 of the phenazine nucleus, and R^3 represents phenyl or p-chlorophenyl, are active against tuberculosis and leprosy.

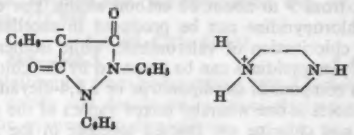
3,592,815

PROCESS FOR PREPARING A PIPERAZINE SALT OF DIPHENYL-1,2-BUTYL-4-DIOXO 3,5-PYRAZOLIDINE

Jean Marie Charles De Muylder, 49 Avenue Reine Astrid, Crainhem, Belgium

Filed July 7, 1967, Ser. No. 651,869
Claims priority, application Belgium, May 9, 1967, 43,432
Int. Cl. C07d *51/64*
U.S. Cl. 260—268 4 Claims

A piperazine salt of diphenyl-1,2-butyl-4-dioxo 3,5-pyrazolidine of the formula



(I)

is produced by dissolving in a solvent such as acetone or methanol, piperazine and the pyrazolidine with the piperazine in stoichiometric excess, at about 30° C. The obtained solution is poured into a solvent such as hexane or ethyl ether to precipitate the salt.

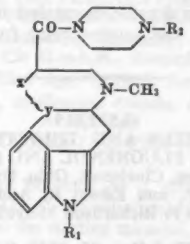
3,592,816

N-SUBSTITUTED PIPERAZIDES OF LYSERGIC ACID

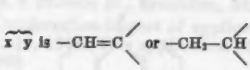
Franz Troxler and Albert Hofmann, Bottmingen, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz A.G.), Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 614,054, Feb. 6, 1967. This application Nov. 1, 1967, Ser. No. 679,646
Claims priority, application Switzerland, Feb. 8, 1966, 1,756/66; Dec. 9, 1966, 17,530/66; July 19, 1967, 10,250/67
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 14 Claims

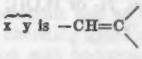
The present invention relates to compounds of general Formula I,



in which R_1 is hydrogen or methyl, and R_2 is aralkyl of 7 to 9 carbon atoms, aryl or aryl substituted by one or more of the following radicals: methyl, alkoxy of 1 to 4 carbon atoms, chlorine or bromine, and



and their acid addition salts. The compounds in which R_1 is hydrogen and



have antidepressive properties. The remaining compounds have sedative properties. The preparation of the compounds is also described.

3,592,817

PREPARATION OF PERCHLOROPYRIDINE AND PERCHLOROCYANOPYRIDINE COMPOUNDS BY VAPOR PHASE CHLORINATION OF ALIPHATIC NITRILES

Howard Johnston, Michael J. Marinak, and Sven H. Ruetman, Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed May 17, 1968, Ser. No. 729,924
Int. Cl. C07d 31/26
U.S. Cl. 260—290 9 Claims

A novel process is disclosed whereby highly chlorinated pyridines and cyanopyridines can be prepared by the vapor phase chlorination of lower aliphatic nitriles containing from 3 to about 10 carbon atoms. For example, pentachloropyridine can be produced in excellent yields by the chlorination of valeronitrile, while isomeric tetrachlorocyanopyridines can be prepared by the chlorination of such compounds as adiponitrile or a 1,4-dicyanobutene. The process is one whereby mixed vapors of the aliphatic nitrile and chlorine are reacted together in the presence of a diluent gas at temperatures of from at least 450° to 750° C.

3,592,818

PROCESS FOR THE PRODUCTION OF ALPHA-PICOLINE AND BETA-PICOLINE IN VAPOR PHASE WITH CATALYSTS BASED ON SILICA MAGNESIA

Jean Herzenberg, Milan, Giorgio Boccato, Venice, and Marcello Pieroni, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed June 28, 1967, Ser. No. 649,447
Claims priority, application Italy, July 1, 1966, 15,162/66
Int. Cl. C07d 31/08
U.S. Cl. 260—290 6 Claims

A process is provided for the preparation of mixtures of alpha-picoline and gamma-picoline comprising the reaction of ammonia and acetaldehyde or paraldehyde in the vapor phase at a temperature of from 200° C. to 650° C. in the presence of

(a) a catalyst comprised of a mixture of silica and magnesia; and

(b) a cadmium fluoride co-catalyst the amount of the magnesia of said catalyst being from 10% to 60% by weight.

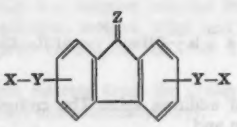
3,592,819

BIS-BASIC ETHERS AND THIOETHERS OF FLUORENONE, FLUORENOL AND FLUORENE

Robert W. Fleming, Cincinnati, Ohio, David L. Wenstrup, Covington, Ky., and Edwin R. Andrews, Cincinnati, Ohio, assignors to Richardson Merrell Inc., New York, N.Y.

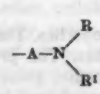
No Drawing. Filed Dec. 30, 1968, Ser. No. 788,038
Int. Cl. C07d 29/36
U.S. Cl. 260—294.7C 27 Claims

Novel bis-basic ethers and thioethers of fluorenone, fluorenol and fluorene selected from a base of the formula



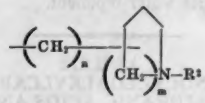
wherein: Z is oxygen, H_2 or H,OH; each Y is oxygen or sulfur; and each X is

(A) the group



wherein A is alkylene of 2 to about 8 carbon atoms and separates the amino nitrogen thereof and Y by an alkylene chain of at least 2 carbon atoms, each R and R^1 is hydrogen, (lower)alkyl, cycloalkyl of 3 to 6 ring carbon atoms, alkenyl of 3 to 6 carbon atoms having the vinyl unsaturation in other than the 1-position of the alkenyl group, or each set of R and R^1 taken together with the nitrogen to which they are attached is pyrrolidino, piperidino, N-(lower)alkylpiperazino, or morpholino; or each X is

(B) the group



wherein *n* is an integer of 0 to 2, *m* is 1 or 2 and R^2 is hydrogen, (lower)alkyl, or alkenyl of 3 to 6 carbon atoms having the vinyl unsaturation in other than the 1-position of the alkenyl group; or a pharmaceutically acceptable acid addition salt of said base.

These compounds can be used as pharmaceuticals for preventing or inhibiting a viral infection.

3,592,820

SUBSTITUTED CATECHOL SALTS OF BENZOTRIAZOLES OR PHENYLHYDRAZINES

Keith Coupland, Hornsea, and John Pennington, Willerby, England, assignors to BP Chemicals (U.K.) Limited, formerly known as Distillers Chemicals and Plastics Limited, London, England

No Drawing. Filed Dec. 18, 1967, Ser. No. 691,125
Claims priority, application Great Britain, Dec. 24, 1966, 57,868/66
Int. Cl. C07c 109/04; C07d 55/04
U.S. Cl. 260—308B 10 Claims

The invention is novel compound which may be produced by reaction of a substituted catechol with either phenylhydrazine or a substituted phenylhydrazine or with benzotriazole or a substituted benzotriazole. The reaction may be carried out in an inert solvent, such as a hydrocarbon. The compounds are useful as antioxidants in lubricant compositions.

5,592,821

2-(2'-HYDROXY-3',5'-DICHLOROPHENYL)-5-CHLORO- OR 5-METHYLBENZIMIDAZOLES

Max Schellenbaum, Muttenz, and Max Duennenberger, Frenkendorf, Switzerland, assignors to CIBA Limited, Basel, Switzerland

No Drawing. Filed May 21, 1968, Ser. No. 730,944
Int. Cl. C07d 49/38
U.S. Cl. 260—309.2 3 Claims

2 - (2' - hydroxy - 3',5' - dichloro - phenyl) - 5 - chloro - or methylbenzimidazoles useful for combating harmful microorganisms.

3,592,822

ADDUCTS OF HEXAHALO ACETONES AND HETEROCYCLIC NITROGEN COMPOUNDS

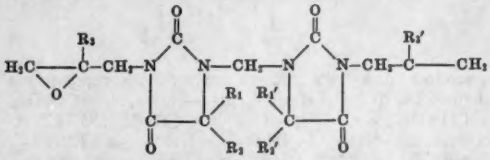
Everett E. Gilbert, Morristown, and Edmund J. Rumanowski, Dover, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Jan. 2, 1969, Ser. No. 789,065
Int. Cl. C07d 49/36, 49/38, 55/04
U.S. Cl. 260—308 6 Claims

Adducts of fluoroperhaloacetones with imidazole, benzimidazole and benzotriazole useful as anticonvulsants, herbicides and antifertility agents against house flies.

3,592,823
N,N'-DIGLYCIDYL COMPOUNDS
Daniel Porret, Binningen, Switzerland, assignor to Ciba Limited, Basel, Switzerland
No Drawing. Continuation-in-part of abandoned application Ser. No. 691,217, Dec. 18, 1967. This application July 18, 1969, Ser. No. 843,215
Claims priority, application Switzerland, Dec. 27, 1967, 18,617/66
Int. Cl. C07d *49/32*
U.S. Cl. 260—309.5 2 Claims

Monomeric, crystalline N,N'-diglycidyl compounds of the formula



in which R_1, R_1', R_2 and R_2' each represents a hydrogen atom or a methyl or ethyl group and R_3 and R_3' each represents a hydrogen atom or a methyl group.

3,592,824
3-SUBSTITUTED AMINO-1,2,3,4-TETRAHYDROCARBAZOLES
Robert Norman Schut, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.
No Drawing. Continuation-in-part of application Ser. No. 670,409, Sept. 25, 1967, which is a continuation-in-part of application Ser. No. 623,244, Mar. 15, 1967, which in turn is a continuation-in-part of application Ser. No. 537,293, Mar. 25, 1966. This application Mar. 12, 1970, Ser. No. 19,084
Int. Cl. C07d *27/68*
U.S. Cl. 260—315 2 Claims

A series of 3-substituted amino-1,2,3,4-tetrahydrocarbazoles in which at least one of the substituents is an alkynyl radical, which may also be substituted in the 6- or 9-positions, useful as analgetic agents.

3,592,825
p-DIOXENE SYNTHESIS
Thomas C. Snapp and Alden E. Blood, Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Dec. 26, 1968, Ser. No. 787,205
Int. Cl. C07d *15/12*
U.S. Cl. 260—340.6 14 Claims

2,3-dihydro-p-dioxin (p-dioxene) is prepared by a process which comprises contacting a mixture of hydrogen, water and diethylene glycol in the vapor phase at elevated temperature over a catalyst comprising copper, silver, nickel, chromium, palladium, platinum or mixtures thereof impregnated on a silica gel support containing at least 99 weight percent silicon dioxide and having a surface area in excess of 500 square meters/gram. p-Dioxene is a valuable intermediate in the preparation of polymers useful, for example, as viscosity improvers for motor oils, and in oxonation and epoxidation reactions to yield cyclic aldehydes and alcohols which are useful, for example, as plasticizers, surface active agents and adhesives.

3,592,826
IMIDAZOLE CATALYSTS FOR DIKETENE REACTIONS
Erich Marcus, Charleston, and John Kai-Fai Chan, South Charleston, W. Va., assignors to Union Carbide Corporation
No Drawing. Filed May 22, 1967, Ser. No. 640,363
Int. Cl. C07d *7/16*
U.S. Cl. 260—343.5 13 Claims

Imidazole catalyzed reactions for the production of dehydroacetic acid, 2,4,6-heptanetrione and 2,6-dimethyl-4-pyranone from diketene are disclosed.

The examples illustrate the use of 1-methylimidazole; 1-ethylimidazole; 1-isopropylimidazole; 1-octylimidazole; 1,2-dimethylimidazole; 1,2-diethyl-4-methylimidazole to catalyze the reactions.

3,592,827
PURIFICATION OF PYROMELLITIC DIANHYDRIDE
Richard I. Bergman, Princeton, N.J., assignor to Princeton Chemical Research, Inc., Princeton, N.J.
No Drawing. Original application June 30, 1965, Ser. No. 468,618. Divided and this application Oct. 28, 1968, Ser. No. 771,367
Int. Cl. C07c *63/32*
U.S. Cl. 260—346.3 5 Claims

Recrystallization from or scrubbing with 1,4-dioxane in order to purify and decolorize, particularly improve the melt color, pyromellitic dianhydride.

3,592,828
17α-(1',3'-ALKADIYNYL)-17β-HYDROXY (17β-ALKOXY)-STEROIDS
Colin Michael Burgess, Peter Feather, and Vladimir Petrow, London, England, assignors to The British Drug Houses Limited
No Drawing. Filed Feb. 27, 1968, Ser. No. 708,526
Claims priority, application Great Britain, Mar. 16, 1967, 12,301/67
Int. Cl. C07c *169/20*
U.S. Cl. 260—397.5 12 Claims

17α - (1',3' - alkadiynyl)-3β,17β-dihydroxy-4-androstenes and 17α-(1',3'-alkadiynyl)-3β,17β-dihydroxy-4-oestrenes together with 3β-esters and 17β-alkylethers thereof are provided. These compounds are useful in the treatment of conditions and defects of the reproductive systems and for the limitation or enhancement of fertility.

3,592,829
PROCESS FOR THE PREPARATION OF A NEW LYSOLECITHIN MIXTURE
Hans Betzing, Heidestock, Germany, assignor to A. Nattermann & Cie G.m.b.H., Braunsfeld, Germany
No Drawing. Filed Apr. 7, 1969, Ser. No. 814,190
Claims priority, application Austria, Apr. 17, 1968, A 3,762/68
Int. Cl. A23j *7/00*; C07f *9/02*
U.S. Cl. 260—403 9 Claims

Lysolecithins are obtained by a mild alcoholysis in which the percentage of the unsaturated fatty acids corresponds at least to the starting material.

3,592,830
ALKYLENEDIAMINE DERIVATIVES CONTAINING CARBOHYDRATES
Nasser, Israily, 8 Browne St., Brookline, Mass. 02146
No Drawing. Continuation-in-part of application Ser. No. 697,299, Jan. 13, 1968. This application May 22, 1970, Ser. No. 39,908
Int. Cl. C07f *15/02*; C07c *101/02*
U.S. Cl. 260—439 10 Claims

This invention relates to chelating agents that are the reaction products of an alkylenediamine such as ethylenediamine or propylenediamine and an aldo or keto carbohydrate. To form the chelating agent of the invention, the diamine is first reacted with hydrogen cyanide and subsequently either hydrolyzed or substituted with side chains and then hydrolyzed. The compounds of the invention form stable chelates with metal ions including iron over a wide range of pH.

3,592,831

NITRATOMETHYL-SILICON COMPOUNDS

Sandor Barcza, West Orange, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Sept. 23, 1968, Ser. No. 761,800
Int. Cl. C07f 7/10
U.S. Cl. 260—448.2N 13 Claims

The compounds are silanes and disiloxanes having at least one nitratomethyl group, e.g., hexakis-nitratomethyl disiloxane. The compounds are useful pharmaceutically, and as explosives and are prepared by reacting an appropriate halomethyl-substituted silane or disiloxane with metallic nitrate, e.g., siver nitrate.

3,592,832

PREPARATION OF AMORPHOUS GUANIDINE SILICATE POWDERS

Paul Clifford Yates, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 4, 1969, Ser. No. 830,543
Int. Cl. C07f 7/02; 7/04
U.S. Cl. 260—448.2N 6 Claims

A process has been developed for preparing dry powders of amorphous guanidine silicate wherein an aqueous solution of water soluble amorphous guanidine silicate having a guanidine to SiO_2 mole ratio of from 0.67:1 to 1.2:1 is mixed with from 1 to 10 volumes of ethanol or isopropanol per volume of solution to precipitate amorphous guanidine silicate, which is then removed and dried. These dry powders of amorphous guanidine silicate find utility as binders for MgO in high temperature ramming mixtures to repair eroded and torn areas in steel blast furnaces.

3,592,833

TRIS-(ORGANOSILYLMETHYL)-AMINES AND PRODUCTION THEREOF

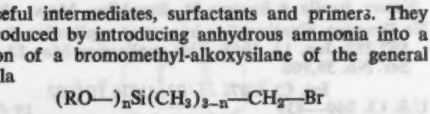
Armand de Montigny, Leverkusen, Dietrich Golitz, Cologne-Stammheim, and Walter Simmler, Odenthal-Schlinghofen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 23, 1968, Ser. No. 731,647
Claims priority, application Germany, June 3, 1967, F 52,594
Int. Cl. C07f 7/02, 7/18
U.S. Cl. 260—448.8R 10 Claims

Novel tris-(organosilyl-methyl)-amines of the general formula

$$[(RO—)_nSi(CH_3)_{3-n}—CH_2—]_3N$$

in which R is an alkyl radical having 1 to 4 carbon atoms and n is 1, 2 or 3 and condensation products derived therefrom and corresponding to the general formula



are useful intermediates, surfactants and primers. They are produced by introducing anhydrous ammonia into a solution of a bromomethyl-alkoxysilane of the general formula

$$(RO—)_nSi(CH_3)_{3-n}—CH_2—Br$$

under atmospheric pressure, the solvent being a polar aprotonic compound the dielectric constant of which is greater than 25 at 20° C., preferably acetonitrile, effecting reaction between the ammonia and the silane at a temperature between −30° C. and the boiling point of the reaction mixture, and separating the trisamine from ammonium bromide and the solvent. Optionally, these tris-amines are hydrolyzed with water to give the above condensation products.

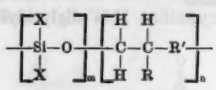
3,592,834

ORGANO-SILICA POLYMERS

Stanley J. Buckman, Rudolf F. Land, and Michael L. Mishler, Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

No Drawing. Filed Jan. 27, 1969, Ser. No. 794,349
Int. Cl. C07f 7/02, 7/04
U.S. Cl. 260—448.8A 15 Claims

Organo-silica polymers having the formula:



wherein m and n are integers independently representing the number of units; R represents —H, —CN, —$CONH_2$, —$CONH_3^{\oplus}$, —COOH, —$COO^{\ominus}$, —COOM, COOR''; R' represents —NH—, —$NH_2^{\oplus}$—, —NR''—, —NR''H$^{\oplus}$—, —NR''$_2^{\oplus}$—, —CH_2—CHR—; and whenever R' contains nitrogen, R'' represents an alkyl or aryl radical; M represents an alkali metal; X represents an —OH, —$O^{\ominus}$, —OM; are suitable as sequestering, dispersing, and flocculating agents.

3,592,835

METHOD OF PREPARING THIONCARBAMATE ESTERS

Robert Andrew Bauman, 10 Landing Lane, New Brunswick, N.J. 07850

No Drawing. Continuation-in-part of abandoned application Ser. No. 502,637, Oct. 11, 1965. This application Nov. 29, 1968, Ser. No. 780,242
Int. Cl. C07c 155/08
U.S. Cl. 260—455 6 Claims

A process for the preparation of thioncarbamate esters which comprises reacting an alkyl or aryl isothiocyanate and a mono- or di-functional alcohol in a reaction medium selected from the group consisting of dialkyl sulfoxide and dialkyl formamide.

3,592,836

ARYLOXYCARBONYL FLUORIDES AND AMINO ACIDS AND THEIR PRODUCTION

Ivar Ugi, Leverkusen, Erich Klauke, Odenthal, Eugen Schnabel, Wuppertal-Elberfeld, and Peter Hoffmann, Cologne-Stammheim, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 21, 1967, Ser. No. 692,272
Claims priority, application Germany, Dec. 23, 1966, F 51,062; Aug. 26, 1967, F 53,338, F 53,339
Int. Cl. C07c 69/00
U.S. Cl. 260—463 3 Claims

Aryloxycarbonyl fluorides such as furfuryloxycarbonyl-, p-methoxybenzyloxycarbonyl- and trimethoxybenzyloxycarbonyl-fluorides are provided which are useful as intermediates for amino acid derivatives and are obtained from carbonyl-fluoride chloride by reaction with the appropriate alcohol. The amino acid derivatives of such carbonyl-fluorides are built up through acylation of amino acids therewith. These amino acid derivatives are useful as intermediates for the synthesis of polypeptides. The reaction of carbonylchloride-fluoride is advantageously carried out at temperatures of 0 to −70° C. in an inert solvent and in the presence of an acid-binding agent. The amino acid derivatives are formed at temperatures between +20 and −20° C. also in the presence of an acid-binding agent. Imino acids can be used in place of amino acids. The amino- or imino-acid derivatives or esters are advantageously prepared at constant, controlled pH values, preferably by the use of automatic pH control equipment.

3,592,837
BIS-(PHENOXYPHENYL) CARBONATES
Walter Traber, Riehen, and Anton G. Weiss, Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Filed July 26, 1968, Ser. No. 747,792
Claims priority, application Switzerland, Aug. 1, 1967, 10,854/67
Int. Cl. C07c *69/00;* **C11d** *3/48;* **A61l** *13/00*
U.S. Cl. 260—463 **6 Claims**

Bis-(phenoxyphenyl) carbonates which are unsubstituted or substituted in one or several of their benzene rings by halogen, lower alkyl or trifluoromethyl are disclosed as antibacterial agents.

3,592,838
7 - OXY - 3,4,4a,9,10,10a - HEXAHYDRO-Δ^3(1H), α-PHENANTHRENEACETIC ACIDS AND ESTERS THEREOF
Philip E. Shaw, Winter Haven, Fla., and Sol J. Daum, Albany, and Robert L. Clarke, Bethlehem, N.Y., assignors to Sterling Drug Inc., New York, N.Y.
No Drawing. Filed Oct. 11, 1966, Ser. No. 585,762
Int. Cl. C07c *65/14*
U.S. Cl. 260—468.5 **3 Claims**

Alkyl polyhydro-2-phenanthrylideneacetates are prepared by interacting the corresponding 2-oxopolyhydrophenanthrenes with a tri-lower-alkyl α-phosphono-lower-alkanoate. Said alkyl polyhydro-2-phenanthrylideneacetates are hydrolyzed to the free acid, and then reesterified via the acid chloride with a tertiary-amino-lower-alkanol to give basic esters having cardiotonic activity.

3,592,839
ALIPHATIC KETO-CARBOXYLIC ACIDS
Ronald L. Broadhead, Addison, Ill., and Yedavalli Shamsunder Rao, Dundas, Ontario, Canada, assignors to The Richardson Company, Melrose Park, Ill.
No Drawing. Filed Dec. 1, 1967, Ser. No. 687,108
Int. Cl. C07c *61/22, 101/44, 149/40*
U.S. Cl. 260—470 **7 Claims**

Aliphatic poly(keto-carboxylic) acid compositions characterized by polyphenyl moieties and useful as curing agents for resins, as plasticizers, and as reactants for polyesters. These compositions are illustrated by 4,4'-oxybis-(3-benzoylpropenoic acid).

3,592,840
PRODUCTION OF VINYL ACETATE
Peter John Durston, Thames Ditton, England, assignor to BP Chemicals (U.K.) Limited, formerly known as Distillers Chemicals and Plastics Limited, London, England
No Drawing. Filed May 17, 1967, Ser. No. 639,067
Claims priority, application Great Britain, June 7, 1966, 25,318/66
Int. Cl. C07c *67/04*
U.S. Cl. 260—497A **4 Claims**

A process for the production of vinyl acetates by the vapour phase catalytic reaction of ethylene, oxygen and acetic acid employing a platinum group metal catalyst supported on titania or mixtures of titania and an alkali metal silicate.

3,592,841
KETO-CARBOXYLIC ACIDS
Ronald L. Broadhead, Addison, Ill., and Yedavalli Shamsunder Rao, Dundas, Ontario, Canada, assignors to The Richardson Company, Melrose Park, Ill.
No Drawing. Filed Dec. 1, 1967, Ser. No. 687,139
Int. Cl. C07c *101/48, 65/14, 149/90*
U.S. Cl. 260—515M **14 Claims**

Aromatic poly(keto-carboxylic) acid compositions characterized by polyphenyl moieties and useful as cross-linking agents for polyesters, as plasticizers, and as reactants in the preparation of polymeric compositions. These compositions are illustrated by 4,4'-oxybis(2-benzoyl benzoic acid).

3,592,842
DICHLORO TRIFLUOROMETHYL BENZOIC ACIDS AND THEIR PREPARATION
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Continuation-in-part of abandoned application Ser. No. 729,944, May 17, 1968. This application Apr. 14, 1969, Ser. No. 816,084
Int. Cl. C07c *63/12*
U.S. Cl. 260—515 **6 Claims**

Dichloro trifluoromethyl benzoic acids are prepared by reacting a dichloro trifluorotoluene with an alkyl lithium ccmpound and treating the resulting compounds with carbon dioxide. The resulting benzoic acids are useful as CNS depressants and agrochemical agents.

3,592,843
PURIFICATION OF L-DOPA
Arnold Brossi, Verona, John Edward Heveran, Fairfield, Edward Arthur MacMullan, Edison, and Bernard Zigmund Senkowski, Bloomfield, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed Jan. 31, 1969, Ser. No. 795,728
Int. Cl. C07c *101/72*
U.S. Cl. 260—519 **20 Claims**

The present invention relates to a process for the optical and chemical purification of L-Dopa by dissolving the impurities in a solvent mixture containing either methanol or ethanol and water and by crystallization, in the presence of ascorbic acid.

3,592,844
RESOLUTION OF RACEMIC AMIDE OF PHENYLALANINE
Donald F. Reinhold, North Plainfield, Walter A. Gaines, Rahway, and Meyer Sletzinger, North Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
Original application Aug. 11, 1964, Ser. No. 388,952, now Patent No. 3,480,670, dated Nov. 25, 1969. Divided and this application Feb. 6, 1969, Ser. No. 822,339
Int. Cl. C07c *101/72*
U.S. Cl. 260—519 **4 Claims**

A process is described for the preparation of L-α-methyl - β - (3,4 - disubstituted-phenyl)alanines which comprises resolution of the intermediate corresponding amide and hydrolysis of the L-amide to the amino acid.

3,592,845
SEPARATION OF 2,3-DIHYDROXY-p-TOLUIC ACID FROM p-TOLUIC ACID
Peter Hosler, Wallingford, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Aug. 30, 1967, Ser. No. 664,259
Int. Cl. C07c *65/04*
U.S. Cl. 260—521 **3 Claims**

A mixture of 2,3-dihydroxy-p-toluic acid and p-toluic acid can be separated by solvent extraction based on the finding that when these two acids, in their free acid form, are first extracted from an aqueous mixture of the same by a water-immiscible lower alkyl ester of a monocarboxylic acid, such as amyl acetate, and the resulting extract is then treated with an aqueous alkali solution to form a solvent phase and an aqueous phase, the 2,3-dihydroxy-p-toluic acid has a much higher affinity for the water phase than does the p-toluic acid. The dihydroxy acid may thus be selectively concentrated in the aqueous phase by repeated solvent-alkali treatments, while the p-toluic acid is recovered from the solvent phase.

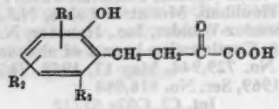
3,592,846

HYDROXY-PHENYL-α-KETOBUTYRIC ACIDS

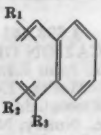
Richard L. Raymond, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Nov. 28, 1967, Ser. No. 686,329
Int. Cl. C07c *65/02*; A01n *9/24*
U.S. Cl. 260—521 8 Claims

Hydroxyphenylketobutyric acids having the structural formula:



wherein R_1 and R_2 are hydrogen or lower alkyl groups having from one to three carbon atoms; R_3 is hydrogen, and wherein R_1 and R_2 may be the same or different, are prepared by subjecting naphthalene or alkyl-substituted naphthalenes having the structural formula:



wherein R_1, R_2, and R_3 are as defined above, to the oxidizing activity of the microorganisms *Nocardia coeliaca*, ATCC No. 21,146, *Nocardia nov.* sp., ATCC No. 21,145, or Streptomyces species, ATCC No. 21,147. These compounds are useful as plant growth regulators.

3,592,847

PROCESS FOR THE PURIFICATION OF TEREPHTHALIC ACID

Robert M. Gallivan, Jr., Buffalo, John H. Bonfield, East Aurora, and Richard C. De Long, Snyder, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed May 2, 1968, Ser. No. 726,206
Int. Cl. C07c *51/42*
U.S. Cl. 260—525 11 Claims

Purification of crude terephthalic acid contaminated with 4-carboxybenzaldehyde, p-toluic acid and other impurities by recrystallizing said crude terephthalic acid from a mixed solvent comprising an anhydride of a lower alkanoic acid and more than two molar proportions of a lower alkanoic acid per molar proportion of crude terephthalic acid. The purified terephthalic acid is suitable for use directly as a monomer for the preparation of high molecular weight polyesters.

3,592,848

METHOD OF PURIFYING TEREPHTHALIC ACID

George Stewart, Tonawanda, and Leon O. Winstrom, East Aurora, N.Y., and Irwin Frankel, Basking Ridge, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 407,518, Oct. 29, 1964. This application May 3, 1968, Ser. No. 726,597
Int. Cl. C07c *51/42*
U.S. Cl. 260—525 10 Claims

Terephthalic acid which has been obtained by the liquid phase oxidation of p-bis(lower alkyl) benzenes especially xylene, is purified by heating with at least one aliphatic ketone containing from 3 to 8 carbon atoms in the liquid phase at superatmospheric pressure and at a temperature above the normal boiling point of the mixture whereby a solution of terephthalic acid in the liquid ketone is produced and cooling the solution thus produced to effect crystallization of purified terephthalic acid crystals.

3,592,849

DECOMPOSITION OF ANHYDRIDES TO ISOMERIC ACIDS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,772
Int. Cl. C07c *51/00*, *53/22*
U.S. Cl. 260—540 8 Claims

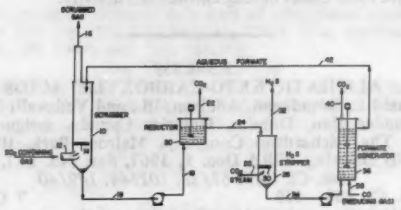
A process for the preparation of acids from their anhydrides with isomerization of the acid by contacting the anhydride with a catalyst comprising a complex of a Group VIII noble metal and a biphyllic ligand at a temperature between 150° C. and 250° C. and at a pressure sufficient to maintain liquid phase reaction conditions. The product acids are useful as intermediates for a variety of products including detergents.

3,592,850

REGENERATION OF FORMATE FROM THIOSULFATE

Nestor J. Mazzocco and Everett Gorin, Pittsburgh, and Paul M. Yavorsky, Monongahela, Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 879,225, Nov. 24, 1969. This application June 17, 1970, Ser. No. 47,040
Int. Cl. C07c *53/06*
U.S. Cl. 260—542 5 Claims



Alkali metal formate is made from alkali metal thiosulfate by the following three steps:

(1) Reduction:

$$4MCOOH+M_2S_2O_3+H_2O=4MHCO_3+2MSH$$

(2) Stripping:

$$MHCO_3+MSH=M_2CO_3+H_2S$$
$$CO_2+H_2O+MSH=MHCO_3+H_2S$$

(3) Formate synthesis:

$$M_2CO_3+2CO+H_2O=2MCOOH+CO_2$$
$$M_2CO_3+CO+H_2=2MCOOH$$

where M is either sodium or potassium. The foregoing process is useful in connection with the absorption of sulfur dioxide from flue gas by alkali metal formate at temperatures above 140° F. to form the corresponding thiosulfate.

3,592,851

2'-AMINO-2-BENZOYL-BENZENESULFONANILIDES

John B. Wright, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Original application May 16, 1968, Ser. No. 638,768, now Patent No. 3,464,996, dated Sept. 2, 1969. Divided and this application May 16, 1969, Ser. No. 825,415
Int. Cl. C07c *143/78*
U.S. Cl. 260—556 3 Claims

6H-dibenzo[c,g][1,2,5]thiadiazocine - 5,5 - dioxides and a method of preparation which involves the con-

densation of a 2-benzoylbenzenesulfonyl halide with an o-phenylene diamine to produce a 2'-amino-2-benzoylbenzenesulfonanilide and the subsequent cyclodehydration of said condensation product is disclosed.

3,592,852

SUBSTITUTED BENZYLIDENEAMINO GUANIDINE

William J. Houlihan and Robert E. Manning, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Dec. 16, 1968, Ser. No. 784,270
Int. Cl. C07c *133/10*
U.S. Cl. 260—564 2 Claims

1 - (2,6 - dimethylbenzylideneamino)-3-hydroxyguanidine hydrochloride; this compound is useful as a hypotensive.

3,592,853

PROCESS FOR MANUFACTURE OF AMINES

George Barsky, New York, N.Y., assignor to Wilson Pharmaceutical & Chemical Corporation

No Drawing. Continuation-in-part of abandoned application Ser. No. 426,672, Jan. 19, 1965. This application Apr. 29, 1968, Ser. No. 725,215
Int. Cl. C07c *85/00, 95/00, 99/00*
U.S. Cl. 260—583R 9 Claims

The process of this invention deals with the manufacture of aliphatic amino compounds formed by the splitting of mono-unsaturated long chain acids, etc., with hydrazoic acid. When an aliphatic monocarboxylic acid, such as oleic acid, is reacted with hydrazoic acid in the presence of a strong mineral acid at a temperature up to 45° C., the carboxyl group is converted to an amine group and a second molecule of hydrazoic acid reacts with the double bond to split the aliphatic group into fragments, one product of which may be, if the starting material were oleic acid, an octyl diamine.

3,592,854

HYDROLYSIS OF AMIDES TO AMINES

Ralph H. Potts, La Grange, and Joseph S. Stalloraitis, Chicago, Ill., assignors to Armour Industrial Chemical Company, Chicago, Ill.

No Drawing. Filed July 19, 1968, Ser. No. 745,993
Int. Cl. C07c *85/00*
U.S. Cl. 260—583 11 Claims

A process for the hydrolysis of amides to amines using large amounts of a lower aliphatic primary alcohol as a mutual solvent to hold both the caustic and the amide in water solution, so as to obtain an homogeneous system.

Heretofore amides have been hydrolized to amines with aqueous caustic. Such processes are economically unattractive as they are slow and require long reaction times. U.S. 2,587,043 shows that the reaction can be speeded up using an organic cosolvent and increasing the reaction temperatures. That reaction still generally requires several hours to reach completion and the hydrolizing medium must be replaced. Further, the crude product obtained is generally dark in color and must be purified by distillation. U.S. 2,281,879 shows a method of preparing an organic nitrogen base by reacting an inorganic salt of the base with an alkali-forming metal hydroxide in an anhydrous water-soluble alcohol and removing the insoluble alkali metal salt thus formed. Although this patent alleges that various amines may be prepared thereby, no specific examples of such preparation are given. Further, the product is an alkali metal salt, and additional purification would be necessary to derive the amine. Also, the process is time consuming, and the medium must be kept substantially anhydrous.

3,592,855

dl-OCTAHYDRO-8β-(t-BUTOXY OR BENZYLOXY)-8aβ-LOWER ALKYL-2(3H)-PHENANTHRONES

Marinus Los, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application June 4, 1964, Ser. No. 372,690, now Patent No. 3,446,849, dated May 27, 1969. Divided and this application Jan. 6, 1969, Ser. No. 789,415
Int. Cl. C07c *49/00*
U.S. Cl. 260—586H 3 Claims

This disclosure describes compounds of the class of dl-2,3,4,4aβ,4bα,5,6,7,8,8a-decahydro-8aβ-lower alkyl - 8β-(t-butoxy or benzyloxy)-2-oxo-1 - substituted - phenanthrenes useful as intermediates in the synthesis of biologically active steroid moieties.

3,592,856

CONDENSATION REACTIONS WITH BORIC ACID

Robert D. Offenhauer, Pennington, N.J., and Stephen F. Nelsen, Madison, Wis., assignors to Mobil Oil Corporation

No Drawing. Filed Dec. 14, 1966, Ser. No. 601,549
Int. Cl. C07c *45/00*
U.S. Cl. 260—590 12 Claims

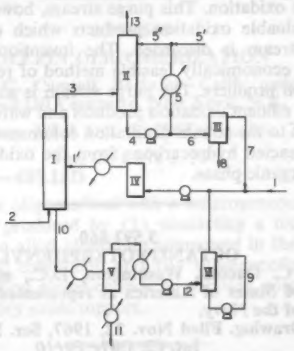
A process for the condensation of aldehydes and ketones in the presence of boric acid for producing unsaturated aldehydes and ketones.

3,592,857

PROCESS FOR PRODUCING ETHYLBENZENE HYDROPEROXIDE

Yoshiyuki Shinohara, Ohtake-shi, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Mar. 4, 1968, Ser. No. 710,140
Claims priority, application Japan, Mar. 8, 1967, 42/14,145
Int. Cl. C07c *73/06*
U.S. Cl. 260—610B 5 Claims



An improved process for producing ethylbenzene hydroperoxide by the liquid phase oxidation of ethylbenzene, which process includes the oxidation reaction step carried out in the reaction zone made of titanium, the alkali treatment step of discharged gas from said reaction zone in vapor phase, said gas being taken out under non-condensing condition from said zone and recovering step of ethylbenzene hydroperoxide.

3,592,858

COLOR STABILIZATION OF HYDROQUINONE ETHERS

Marshall R. Brimer, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Feb. 28, 1969, Ser. No. 803,464
Int. Cl. C07c *41/12*
U.S. Cl. 260—611.5 6 Claims

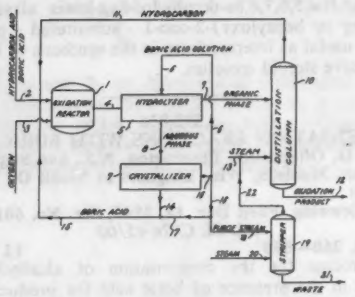
An alkyl or a hydroxyalkyl ether of hydroquinone containing a discoloration-inhibiting amount of a cyclic phosphite.

3,592,859

RECOVERY OF RESIDUAL PRODUCT IN HYDROCARBON OXIDATION PROCESS

Richard L. Marcell, Bergenfield, N.J., and James Leacock, New York, N.Y., assignors to Halcon International, Inc.

Filed Jan. 17, 1967, Ser. No. 609,881
Int. Cl. C07c *31/02, 35/02, 35/08*
U.S. Cl. 260—631 6 Claims



In the oxidation of hydrocarbons, e.g., cyclohexane, in the presence of boron compounds, e.g., metaboric acid, the reaction product contains borate esters of the alcohol corresponding to the aforesaid hydrocarbon. The ester is hydrolyzed to form an aqueous phase containing boric acid and an organic phase. While a portion of the aqueous phase is dehydrated and the recovered boron compound recycled to the oxidation, a portion must be purged in order to prevent impurity accumulation which interferes with the oxidation. This purge stream, however, also contains valuable oxidation products which are lost if the purge stream is discarded. The invention is concerned with an economically feasible method of recovering these oxidation products. The purge stream is stripped to separate the effluent oxidation products and water. The effluent is added to the stream distillation column used to separate the unreacted hydrocarbons from the oxidation products in the organic phase.

3,592,860

OCTANITROTERPHENYL

Joseph C. Dacons, Washington, D.C., assignor to the United States of America as represented by the Secretary of the Navy.

No Drawing. Filed Nov. 22, 1967, Ser. No. 685,736
Int. Cl. C07c *79/10*
U.S. Cl. 260—645 9 Claims

A new explosive compound of 2,2'',4,4',4'',6,6',6''-octanitro-m-terphenyl and methods for preparing it.

3,592,861

PROCESS FOR THE PREPARATION OF NITROBENZAL FLUORIDES

Erich Klauke, Odenthal-Hahnenberg, and Engelbert Kuhle, Bergisch Gladbach, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed June 3, 1969, Ser. No. 830,134
Claims priority, application Germany, June 10, 1968, P 17 68 635.0
Int. Cl. C07c *79/12*
U.S. Cl. 260—646 15 Claims

Reacting nitrobenzal chlorides, i.e. 2-(optionally chloro)-3 or 4-nitro-benzal chlorides or 1-dichloromethyl-2-(optionally chloro)-3 or 4-nitro-benzenes with anhydrous hydrogen fluoride at a temperature of about 0–150° C. and a pressure of about 1–26 atmospheres absolute, optionally in the presence of an inert organic liquid solvent, to form in high yield and purity the corresponding nitrobenzal fluorides, i.e. 2-(optionally chloro)-3 or 4-nitro-benzal fluorides or 1 - difluoromethyl-2-(optionally chloro)-3 or 4-nitro-benzenes, some of which are known, and which are intermediates for the production of the corresponding N-(difluoromethyl-phenyl)-N',N'-dimethyl ureas which possess pesticidal, especially herbicidal, properties.

3,592,862

SELECTIVE HYDROGENATION OF DIENES

Darryl R. Fahey, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,072
Int. Cl. C07c *5/14, 5/16*
U.S. Cl. 260—666 14 Claims

The hydrogenation of cyclic and acyclic dienes to monoenes is improved by promoting trihydrocarbylphosphine modified carbonyl cobalt catalysts with alcohols, ethers, and amides.

3,592,863

PROCESS FOR THE PREPARATION OF 2,3-DIMETHYL-2,3-BIS-(4-NITRO PHENYL)-BUTANE

Alfons Klein, Duesseldorf, and Karlfried Wedemeyer, Cologne-Stammheim, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed June 6, 1969, Ser. No. 831,220
Claims priority, application Germany, June 26, 1968, P 17 68 748.8
Int. Cl. C07c *79/10*
U.S. Cl. 260—645 10 Claims

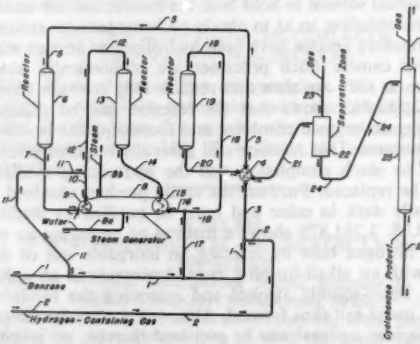
2,3-dimethyl-2,3-bis-(4-nitro phenyl)-butane is obtained by heating 4-nitrocumene in a polar organic solvent (e.g. dimethylsulfoxide) in the presence of a basic compound (e.g. sodiumhydroxide) and of an alcohol which is resistant to oxidation (e.g. tert. butanol).

3,592,864

HYDROGENATION OF BENZENE TO CYCLOHEXANE

Stephen A. Gewartowski, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 27, 1969, Ser. No. 837,187
Int. Cl. C07c *5/10*
U.S. Cl. 260—667 12 Claims



Process for hydrogenating benzene to form cyclohexane utilizing once-through hydrogen-containing gas wherein the exothermic heat of reaction is utilized as the sole source of heat input to steam generation means and

wherein the processing system is enhanced by the elimination of recycle gas compressors, treaters, coolers and heaters.

3,592,865

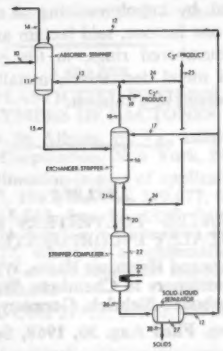
SEPARATION AND RECOVERY OF COMPLEXIBLE LIGANDS BY LIQUID EXCHANGE

Robert B. Long, Atlantic Highlands, John P. Longwell, Westfield, and Fred A. Caruso, Elizabeth, N.J., and Richard J. DeFeo, Baton Rouge, La., assignors to Esso Research and Engineering Company

Filed Sept. 3, 1968, Ser. No. 756,925

Int. Cl. C07c *7/00, 11/00;* **B01j** *11/22*

U.S. Cl. 260—677A **39 Claims**



Complexible ligands contained in a feed stream are complexed with a liquid sorbent solution of cuprous aluminum halide. The complexed complexible ligands are then separated by a ligand exchange operations generally requiring $n-1$ ligand exchange operations for n complexed complexible ligands to be separated. The separation in each ligand exchange operation is effected by contacting the several complexed complexible ligands with a stripping ligand which forms a more stable complex with the sorbent than the complexible ligand or ligands to be separated and recovered, and exchanging the stripping ligand for the complexible ligand or ligands in the sorbent complex.

3,592,866

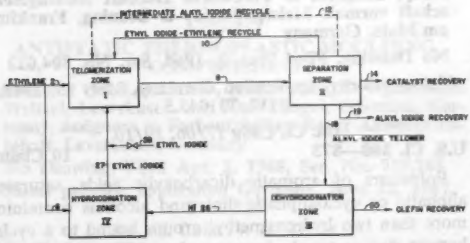
ALPHA-OLEFIN PRODUCTION

Eugene F. Magoon, Walnut Creek, and Lynn H. Slaugh, Lafayette, Calif., assignors to Shell Oil Company, New York, N.Y.

Filed June 11, 1969, Ser. No. 832,218

Int. Cl. C07c *9/00, 11/02*

U.S. Cl. 260—677H **6 Claims**



Ethylene is converted to linear alpha-olefins by (1) telomerizing ethylene and ethyl iodide to linear primary alkyl iodides (2) separating and dehydroiodinating the alkyl iodides to produce linear alpha-olefins and hydrogen iodide and (3) hydroiodinating ethylene with the hydrogen iodide to produce ethyl iodide for recycle to provide the ethyl iodide for telomerization with ethylene.

3,592,867

ETHYLENE-PRODUCING PROCESS

Ernest L. Pollitzer, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Sept. 8, 1969, Ser. No. 856,161

Int. Cl. C07c *3/00, 11/24*

U.S. Cl. 260—683 **9 Claims**

Propane is subjected to dehydrogenation in contact with a non-acidic, Group VIII noble metal catalyst to produce propylene. The propylene is subjected to hydrocracking, in contact with a Group VIII metal component hydrocracking catalyst to produce ethylene. The process produces ethylene in essentially 100.0% molal yields, based upon propane feed.

3,592,868

OLEFIN ISOMERIZATION

Louis F. Heckelsberg, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,504

Int. Cl. C07c *5/22*

U.S. Cl. 260—683.2 **5 Claims**

Olefins are isomerized by shifting the double bond by contact with a catalyst comprising ruthenium oxide.

3,592,869

OLEFIN OLIGOMERIZATION

Lawrence G. Cannell, Berkeley, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Oct. 3, 1968, Ser. No. 764,910

Int. Cl. C07c *3/10*

U.S. Cl. 260—683.15D **10 Claims**

Olefins are oligomerized with a heterogeneous catalyst composition produced by (1) contacting a nickel compound and an alkyl aluminum compound in the presence of an olefinic compound and (2) subsequently contacting the resulting nickel-containing solution with an inorganic refractory oxide support.

3,592,870

NICKEL COMPLEX OLEFIN DIMERIZATION

Howard E. Dunn, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed May 5, 1969, Ser. No. 821,956

Int. Cl. C07c *3/10*

U.S. Cl. 260—683.15 **18 Claims**

An olefin is dimerized by contact with a catalyst formed from an organoaluminum compound and one of the following nickel complexes:

(a) A bis(β-mercaptoethylamine)nickel (II) complex;
(b) An α-diketobis(β-mercaptoethylimine)nickel (II) complex;
(c) A S,S-disubstituted bis(β-mercaptoethylamine)nickel (II) complex; or
(d) A S,S-disubstituted-α-diketone bis(β-mercaptoethylimine)nickel (II) complex.

3,592,871

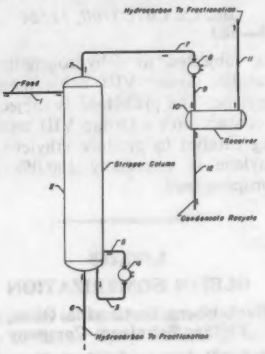
PROCESS FOR SEPARATING AN ALKYLATE-CONTAINING HYDROCARBON MIXTURE UTILIZING A STRIPPING AND PARTIAL CONDENSATION SYSTEM

Edwin K. Jones, Kenilworth, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 12, 1969, Ser. No. 806,395

Int. Cl. C07c 3/54

U.S. Cl. 260—683.43 4 Claims



A process is provided for separating a hydrocarbon feed mixture comprising C_3 hydrocarbons, C_4 hydrocarbons and alkylate utilizing a stripping and partial condensation system.

3,592,872

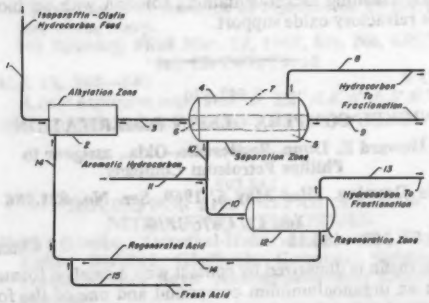
PROCESS FOR THE REGENERATION OF A USED SULFURIC ACID ALKYLATION CATALYST

Edwin K. Jones, Kenilworth, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 3, 1969, Ser. No. 803,540

Int. Cl. C07c 3/54

U.S. Cl. 208—683.62 7 Claims



A sulfuric acid alkylation catalyst is regenerated by a continuous in-situ process utilizing steps including separation and the subsequent selective reaction of an aromatic compound with the olefinic hydrocarbon portion of a sulfuric acid-olefinic hydrocarbon mixture at temperatures below about 72° F.

3,592,873

POLYOXYMETHYLENES CONTAINING LACTAM-LACTONE INTERPOLYMERS

Shinichi Ishida, Tokyo, Kunio Sato, Kawasaki-shi, Hiroshi Komoto, Iruma-gun, Saitama-ken, Hiromichi Fukuda, Tokyo, and Masaki Ishigami, Iruma-gun, Saitama-ken, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed May 24, 1968, Ser. No. 731,729

Claims priority, application Japan, May 24, 1967, 42/33,492

Int. Cl. C08g 41/04

U.S. Cl. 260—857 4 Claims

A thermally stabilized polyacetal composition characterized in that said composition containing a polyamide ester obtained by copolymerizing at least one lactam with at least one lactone, said lactam and lactone having 4 or more membered rings, in the presence of alkali metals, alkali metal derivatives, metallic magnesium or derivatives thereof, as a catalyst.

3,592,874

UNSATURATED POLYESTERS CONTAINING CHEMICALLY INCORPORATED COBALT

Johannes Reese and Hermann Hotze, Wiesbaden-Biebrich, Germany, assignors to Chemische Werke Aktiengesellschaft, Wiesbaden-Biebrich, Germany

No Drawing. Filed Aug. 30, 1968, Ser. No. 756,406

Claims priority, application Germany, Sept. 6, 1967, P 16 69 859.2

Int. Cl. C08f 21/00, 21/02

U.S. Cl. 260—870 6 Claims

A process for the manufacture of a hardenable polyester composition by (A) transesterifying high molecular weight polyesters of isophthalic or terephthalic acid or of both acids with a polyhydric alcohol in the presence of a cobalt salt and chemically building in the cobalt into the polyester, (B) further esterifying the product of (A) with units of an unsaturated polycarboxylic acid or a mixture thereof with an alcohol and (C) admixing the product of (B) with an unsaturated copolymerizable monomer to yield a composition hardenable by a peroxide catalyst without the further addition of an accelerator.

3,592,875

MOULDING COMPOSITIONS CONTAINING THERMOPLASTIC POLYESTERS

Ludwig Brinkmann and Walter Herwig, Frankfurt am Main, and Klaus-Dieter Asmus, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Mar. 3, 1969, Ser. No. 804,022

Claims priority, application Germany, Mar. 23, 1968, P 17 70 043.5

Int. Cl. C08g 17/06, 39/10

U.S. Cl. 260—873 10 Claims

Polyesters of aromatic dicarboxylic acids, saturated aliphatic or cycloaliphatic diols and alcohols containing more than two hydroxymethyl groups bound to a cyclohexane ring or tetrahydropyran ring. The said polyesters are used for making injection moulded articles that are free from flash formation.

3,592,876

THERMOPLASTIC POLYESTER MOULDING COMPOSITIONS

Ludwig Brinkmann and Walter Herwig, Frankfurt am Main, and Klaus-Dieter Asmus, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Mar. 3, 1969, Ser. No. 803,991

Claims priority, application Germany, Mar. 23, 1968, P 17 69 035.6

Int. Cl. C08g *17/06*

U.S. Cl. 260—873 **9 Claims**

Method for making shaped articles by injection moulding polyester compositions comprising aromatic dicarboxylic acids, saturated aliphatic or cycloaliphatic diols and alcohols having more than two primary hydroxyl groups. The shaped articles do not show flash formation.

3,592,877

VINYL RESINS PLASTICIZED WITH SOLID LINEAR POLYMERS OF LACTONES

Dennis H. Mullins, St. Albans, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 639,054, May 17, 1967, Ser. No. 319,677, Oct. 29, 1963, and Ser. No. 168,233, Jan. 23, 1962. Said application Ser. No. 639,054 being a continuation of application Ser. No. 319,677, which is a continuation-in-part of application Ser. No. 168,233. This application Apr. 1, 1969, Ser. No. 812,353

Int. Cl. C08f *29/22, 37/18, 45/36*

U.S. Cl. 260—874 **35 Claims**

A vinyl resin plasticized with a plasticizing amount of relatively high molecular weight, solid, linear polymers of lactones.

3,592,878

COMPOSITIONS COMPRISING A HIGH CIS GRAFT COPOLYMER AND A HIGH TRANS GRAFT COPOLYMER

Zygmunt Kromolicki, Bramhall, England, assignor to Sterling Moulding Materials Limited, London, England

No Drawing. Filed June 23, 1967, Ser. No. 648,212

Claims priority, application Great Britain, June 24, 1966, 28,552/66

Int. Cl. C08f *41/12*

U.S. Cl. 260—876 **7 Claims**

Homogeneous mixtures of a high cis polybutadiene graft polymer with a vinyl aromatic compound, a polymer or copolymer of a vinyl aromatic compound, and a high trans diene hydrocarbon graft polymer with a vinyl aromatic compound are provided, which provide an unexpected combination of high impact strength, high tensile strength and high softening point together with good surface gloss of mouldings; the vinyl aromatic compound is preferably styrene or mixtures with α-methyl styrene.

3,592,879

ANTISTATIC THERMOPLASTIC MOULDING COMPOSITIONS

Karl-Heinz Ott, Leverkusen, Harry Röhr, Cologne, Hans Weitzel, Leverkusen, and Karl Dinges, Odenthal, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 2, 1968, Ser. No. 718,255

Claims priority, application Germany, June 22, 1967, F 52,753

Int. Cl. C08f *19/08, 41/04*

U.S. Cl. 260—876 **6 Claims**

Elastic thermoplastic moulding compositions of copolymer mixtures of an elastic copolymer or graft polymer of butadiene and a thermoplastic copolymer based on styrene and acrylonitrile, which has excellent electrostatic properties and which contains as an antistatic agent a mixture of (a) a dialkanolalkylamine and (b) an alkyl or aryl alkyl sulfonate.

3,592,880

PROCESS FOR PREPARING POLYOLEFINS

Bernd Diedrich and Karl Diether Kreil, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Dec. 27, 1967, Ser. No. 693,721

Claims priority, application Germany, Jan. 28, 1967, F 51,374

Int. Cl. C08f *15/00*

U.S. Cl. 260—878 **7 Claims**

Polyethylene or copolymers of ethylene and higher α-olefins having a high stress cracking resistance, are prepared by a process which comprises two reaction steps of a suspension or gaseous phase polymerization, in which a mixed catalyst of a trivalent chlorine-containing titanium compound and an aluminium trialkyl or a reaction product of aluminium trialkyls or alkylhydrides with diolefins is used, the hydrogen content of the gas zone being low in one step and high in the other step.

3,592,881

CROSSLINKED, HEAT-SHRINKABLE POLYETHYLENE FILM COMPOSITION

George Joseph Ostapchenko, Williamsville, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 16, 1969, Ser. No. 833,767

Int. Cl. C08f *29/12*

U.S. Cl. 260—897 **4 Claims**

A heat-shrinkable, heat-sealable film prepared by crosslinking an oriented film of a blend of low-density and high-density polyethylenes containing a minor amount of an ethylene, propylene, non-conjugated diene terpolymer. The crosslinking is accomplished with sulfur monochloride.

ERRATA

For Classes 260—47, 260—272, 260—453, 260—479, 260—613, 260—624, 260—857, 264—49, 264—108 see: Patent Nos. 3,592,946 thru 3,592,954

3,592,882

CONTINUOUS CASTING METHOD FOR MAKING PEARLIZED RESIN MATERIALS

Yoshio Morita, Tokyo, Japan, assignor to Nihon Koken Kogyo Company, Ltd., Tokyo, Japan

Filed Aug. 13, 1968, Ser. N. 752,315

Int. Cl. B29f *3/12;* **B29d** *19/00*

U.S. Cl. 264—1 **5 Claims**

A continuous method for casting a liquid plastic mixture of a light-transmitting resin and pearl essence is provided. The plastic mixture is passed through an extruder containing a plurality of thin plates in a prearranged spaced relationship for orienting the pearl essence within the resin. The extrudate is covered on each side by plastic films to insulate it from the open air, and is passed continuously past a heat source to solidify the resin and fix the orientation of the pearl essence. A novel apparatus is

provided for carrying out the process. The pearlized resin materials made according to the invention are useful for

buttons, interior architectural materials, and ornamental goods.

3,592,883

MARKING CARBONIZED PENCIL LEADS USING SULFONATED LIGNIN OR AN AQUEOUS SODIUM SALT OF LIGNIN AS A BINDER

Takamasa Kawakubo, Koza County, Kanagawa Prefecture, Japan, assignor to Mitsu-bishi Pencil Company Limited, Tokyo, Japan

No Drawing. Filed Feb. 12, 1969, Ser. No. 798,763
Claims priority, application Japan, Mar. 21, 1968, 43/17,978; June 11, 1968, 43/39,626
Int. Cl. C09d *13/00*
U.S. Cl. 264—29 **5 Claims**

Pencil lead is made by mixing 40 to 50 parts of sulfonated lignin or an aqueous sodium salt lignin solution with 30 to 40 parts graphite and 5 to 10 parts of carbon black, kneading the mixture and heating to reduce the moisture content to below 20%. After extruding the mixture into the form of pencil lead and drying the formed articles they are heated to about 500° C. at a very slow rate of 5–10° C. per hour. Once 500° C. has been reached the articles are further heated to above 1000° C. at a faster rate of 30–50° C. per hour in a gaseous phase atmosphere that is inert to the articles, such as nitrogen. The very slow heating rate up to 500° C. is essential to good strength of the carbonized pencil lead. Supplementary binders and plasticizers such as polyvinyl alcohol, tragacanth gum, sodium alginate and carboxymethylcellulose can be added to prevent premature thermal decomposition of the lignin.

3,592,884

COMPOSITE PROPELLER SHAFT CONSTRUCTION AND METHOD OF MAKING

Charles W. Williams, Essexville, Mich., assignor to General Motors Corporation

Filed June 7, 1967, Ser. No. 644,184
Int. Cl. B29d *15/00*
U.S. Cl. 264—45 **2 Claims**

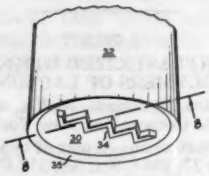
A vehicle propeller shaft includes a pair of spaced end members having inner ends with characterized surfaces. A light but stiff cylindricar arbor, such as of polyurethane foam, connects the end members and a tube formed of hardened thermosetting resin reinforced with fiber glass filaments is formed on the arbor and interlockingly engages the characterized surfaces of the end members. A method of forming such a shaft includes steps of forming a polyurethane foam arbor between the end members and forming the resin bonded fiberglass tube in place on the arbor and end members.

3,592,885

CORRUGATED PARISON REAL LINE

Robert R. Goins and Dixie E. Gilbert, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Dec. 13, 1968, Ser. No. 783,605
Int. Cl. B29c *17/07*
U.S. Cl. 264—98 **6 Claims**



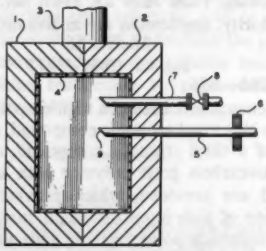
The bottom of an open end parison is sealed along a corrugated line.

3,592,886

DIRECTIONAL COOLING IN BLOW MOLDING

John E. Havely, Winfield, Kans., assignor to Phillips Petroleum Company

Original application July 5, 1966, Ser. No. 562,849, now Patent No. 3,488,801, dated Jan. 13, 1970. Divided and this application May 29, 1969, Ser. No. 829,054
Int. Cl. B29c *17/07*
U.S. Cl. 264—98 **10 Claims**



In a blow molding process wherein a parison is punctured to admit fluid, cooling fluid is directed to certain points in the parison so as to achieve selective cooling.

3,592,887

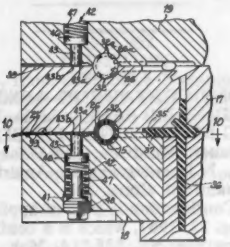
METHOD OF INJECTION MOLDING OF PLASTIC COATING ON HOLLOW METAL BODY

George N. Edwards, Newark, Ohio, assignor to Roper Corporation, Kankakee, Ill.

Filed Feb. 19, 1969, Ser. No. 800,534
Int. Cl. B29f *1/06, 1/10*
U.S. Cl. 264—161 **4 Claims**

A method for coating a hollow body with plastic material by injection molding to prevent collapse of the hollow body in the molding operation. The pressure in

the die cavity is relieved by the automatic opening of a valve disposed in the die plate to vent the die cavity to the atmosphere when pressure in the die cavity exceeds a



predetermined value. Nibs are provided in the die cavity to support the body and prevent permanent deformation of the body in the molding cycle.

3,592,888

RADIOIMMUNOASSAY OF ANGIOTENSIN AND RENIN ACTIVITY

Robert L. Wolf, New York, N.Y., assignor to Mount Sinai Hospital Research Foundation, Inc., New York, N.Y.

Filed Jan. 19, 1968, Ser. No. 699,098
Int. Cl. A61k *27/04*
U.S. Cl. 424—1 **10 Claims**

A process for assaying the quantity of angiotensin and renin employing radioimmunoassay techniques, comprising the steps of combining solutions of (1) antibody to angiotensin coupled to poly-L-lysine, (2) angiotensin labeled with radioactivity, and (3) varying known amounts of unlabeled angiotensin, to produce mixtures having a pH of about 7.0 to 9.5, which upon incubation form angiotensin-antibody complexes. The mixtures of angiotensin-antibody complexes (antibody-bound angiotensin) and free angiotensin are applied either to paper strips, coated charcoal, ion exchange resins or resin sponges, and subjected to radioimmunoassay techniques to separate the antibody-bound angiotensin complexes from the free angiotensin. Some of the free and antibody-bound angiotensin is radioactive; the ratio of radioactivity of the antibody-bound angiotensin complex to free angiotensin is plotted as a function of the known concentrations of angiotensin in each mixture to prepare a standard concentration graph. The process is repeated employing unknown amounts of unlabeled angiotensin, which may be derived from the action of renin on renin substrate, and the concentration of angiotensin is read from the graph.

3,592,889

PROCESS FOR THE PRODUCTION OF AN INTRAMUSCULARLY INJECTABLE IRON PREPARATION FOR ANIMALS

Sven Lindvall and Gustav Högberg, Sodertalje, Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden

Filed Dec. 15, 1967, Ser. No. 691,073
Claims priority, application Sweden, Dec. 15, 1966, 17,238/66
Int. Cl. A61k *27/00*
U.S. Cl. 424—147 **6 Claims**

A method for combating anemia in piglets is disclosed, characterized by the administration of an iron injection solution containing an iron complex. In the preparation of the injection solution a precipitated complex is first formed by reaction between a soluble ferric salt and lactic acid in the presence of a water-soluble carbohydrate as a dispersion stabilizer. The precipitated iron complex is dispersed in the presence of citric acid and a hexitol such as sorbitol to form an injection solution in which the complex has a molecular weight in excess of 40,000.

3,592,890

METHOD OF COMBATING ATROPHIC RHINITIS

Marian Janiak, Basel, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Continuation-in-part of abandoned application Ser. No. 550,640, May 17, 1966. This application Jan. 13, 1970, Ser. No. 2,654
Claims priority, application Switzerland, June 4, 1965, 7,878/65
Int. Cl. A61k *27/00*
U.S. Cl. 424—229 **8 Claims**

A prophylactic veterinary method of combating atrophic rhinitis which comprises parenterally or enteral administering to an animal e.g. during the second week of life, an effective amount of 5-(para-aminobenzenesulfonamido)-1-phenyl-3-methyl-pyrazole, said compound being in the form of a salt.

3,592,891

METHOD OF TREATING LESIONS OF THE ORAL ORIFICE

Sam J. Dawson and James Moody Brock, Montgomery, Ala., assignors to A.Q.S., Inc., Montgomery, Ala.

No Drawing. Filed Feb. 25, 1969, Ser. No. 802,205
Int. Cl. A61r *27/00*
U.S. Cl. 424—259 **4 Claims**

A method of treating lesions of the oral orifice which comprises contacting said lesions with a composition which includes quinine bisulfate.

3,592,892

ANTIFUNGAL AND ANTIBACTERIAL NITROALKYL-N-PHENYLCARBAMATES

Heinz Gunter Nosler, Monheim, Rhineland, and Richard Wessendorf, Hilden, Rhineland, Germany, assignors to Henkel & Cie, GmbH, Dusseldorf-Holthausen, Germany

No Drawing. Filed July 25, 1968, Ser. No. 747,477
Claims priority, application Germany, Dec. 4, 1967, H 64,654
Int. Cl. A01n *9/20*
U.S. Cl. 424—300 **18 Claims**

Novel antimicrobic compositions having fast kill times comprised of nitroalkyl-N-phenylcarbamates and dimethyl sulfoxide and ethanol or propanol.

3,592,893

NITRO ALCOHOLS IN SYNERGISTIC ANTIMICROBIC COMPOSITIONS

Heinz Gunter Nosler, Monheim, Rhineland, Richard Wessendorf, Hilden, Rhineland, and Horst Bellinger, Dusseldorf, Germany, assignors to Henkel & Cie, GmbH, Dusseldorf, Germany

No Drawing. Filed Mar. 1, 1968, Ser. No. 709,834
Claims priority, application Germany, Apr. 26, 1967, H 62,546
Int. Cl. A01n *9/20, 9/24*
U.S. Cl. 424—329 **7 Claims**

Synergistic antimicrobic compositions comprised of an aliphatic alcohol having 2 to 5 carbon atoms in a straight chain and having at least one nitro group and 1 to 4 hydroxy groups and a compound selected from the group consisting of a phenolic antimicrobic compound and a cationic quaternary ammonium compound having at least one hydrophobic chain of 8 to 18 carbon atoms.

3,592,894

TREATMENT OF INTESTINAL HELMINTHIASIS WITH TETRACHLOROFULVENES

Alvin Wagner and James W. Kessel, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 16, 1968, Ser. No. 784,175
Int. Cl. A61k *27/00*
U.S. Cl. 424—352 **2 Claims**

Domestic animals afflicted with intestinal helminthiasis are treated with 1,2,3,4-tetrachlorofulvenes substituted

with an aryl radical at the 6 position. The active agent can be administered in pill or capsule form or as a drench but is preferably incorporated in the feed and/or water supplied to the animal.

3,592,895

PYRIMIDINE DERIVATIVES AS ANTI-INFLAMMATORY, ANALGESIC AND ANTIPYRETIC AGENTS

Walter Hepworth and Thomas Walton Thompson, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Original application May 16, 1967, Ser. No. 638,726, now Patent No. 3,502,673, dated Mar. 24, 1970. Divided and this application Oct. 24, 1969, Ser. No. 871,335

Claims priority, application Great Britain, June 17, 1966, 27,083/66

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 **3 Claims**

The disclosure relates to phenyl (and benzyl)-pyrimidyl-alkanoic acids and related compounds which possess anti-inflammatory, analgesic and antipyretic activity, processes for making said acids and compounds, pharmaceutical compositions containing at least one of said acids and compounds, and the method of using said acids and compounds in a host needing said activity. Representative of the compounds disclosed are methyl 2-p-chlorophenyl - 6 - methoxypyrimid - 4 - ylacetate, diethyl 2 - (2 - p - chlorophenyl - 6 - methoxypyrimid - 4 - yl)-malonate, 2-p-chlorophenyl - 6 - methoxy - 4 - methylpyrimid - 5 - ylacetic acid, and methyl α-(2-p-chlorophenyl-6-methoxypyrimid-4-yl)propionate.

3,592,896

SULFOXIDE CONTAINING PESTICIDES

Paul C. Aichenegg, Prairie Village, Kans., and Carl D. Emerson, Kansas City, Mo., assignors to Chemagro Corporation, New York, N.Y.

No Drawing. Filed Jan. 27, 1964, Ser. No. 340,504

Int. Cl. A01n *9/00, 9/12*

U.S. Cl. 424—337 **6 Claims**

This invention relates to a method for killing nematodes and fungi with sulfoxide compounds.

3,592,897

INSECT CHEMOSTERILANT COMPOSITIONS AND METHODS—THIOLCARBAMATES

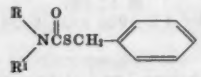
Philip C. Hamm, Glendale, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Oct. 23, 1967, Ser. No. 677,077

Int. Cl. A01n *9/12, 9/20*

U.S. Cl. 424—300 **4 Claims**

Compounds of the following formula are insect chemosterilants:



wherein R is selected from the group consisting of alkyl, alkenyl and alkynyl of not more than 8 carbon atoms and R^1 is selected from the group consisting of hydrogen, alkyl, alkenyl and alkynyl of not more than 8 carbon atoms.

3,592,898

NONADDICTIVE COMBINATIONS OF ANALGETICS WITH AMPHETAMINES HAVING SUBSTITUENTS ON THE PHENYL GROUP

John H. Biel, 4444 N. Murray Ave., Milwaukee, Wis. 53211

No Drawing. Filed Mar. 7, 1969, Ser. No. 805,373

Int. Cl. A61k *27/00*

U.S. Cl. 424—260 **12 Claims**

Disclosed are combinations of an analgetic with p-chloroamphetamine and other amphetamines containing at least one substituent on the phenyl ring, and non-toxic acid addition salts thereof. When such combinations are administered, tolerance, physical dependence and addiction are not induced.

3,592,899

COMPOSITIONS CONTAINING 4-(ISOXAZOL-3 OR 5-YL)-PYRIDINIUM SALTS AND METHOD OF LOWERING BLOOD SUGAR LEVELS

Victor John Bauer, Montvale, and Sidney Robert Safir, River Edge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 662,281, Aug. 22, 1967, which is a continuation-in-part of application Ser. No. 535,714, Mar. 21, 1966. This application Nov. 10, 1969, Ser. No. 875,528

Int. Cl. A01n *9/00, 9/22*

U.S. Cl. 424—263 **9 Claims**

This application describes compositions containing quaternary isoxazolylpyridinium salts and quaternary isothiazolylpyridinium salts and also the method of use of the isoxazolylpyridinium salts and isothiazolylpyridinium salts. These compositions are useful in warm-blooded animals for their hypoglycemic activity.

3,592,900

METHOD FOR LOWERING ELEVATED BLOOD SUGAR LEVELS USING A DIHYDROPYRIDINE HYDROHALIDE

John B. Bicking, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Aug. 12, 1968, Ser. No. 751,732

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 **6 Claims**

A method for lowering elevated blood sugar levels in warm-blooded animals by the administration of a 1-(aralkyl or aralkenyl)-4-imino-1,4-dihydropyridine hydrohalide is described. The hypoglycemic agents are prepared by the reaction of an aralkyl or aralkenyl halide with 4-amino-pyridine. The aralkyl or aralkenyl halide as well as the 4-aminopyridine optionally can be substituted.

3,592,901

ANTIBACTERIAL SYNTHESIZED NITROFURYL DERIVATIVES

Erich Haack, deceased, late of Heidelberg, Germany, by Helmut Bernhard Haack, Gunhild Renate Haack, and Doris Leonie Haack, his heir and heiresses and legal representatives, Herbert Berger, Mannheim-Kafertal, and Wolfgang Vömel, Mannheim, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

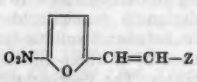
No Drawing. Continuation-in-part of application Ser. No. 739,600, May 10, 1968, which is a division of application Ser. No. 599,384, Dec. 6, 1966, which is a continuation-in-part of application Ser. No. 452,355, Apr. 10, 1965, which in turn is a continuation-in-part of application Ser. No. 351,841, Mar. 13, 1964. This application July 2, 1969, Ser. No. 840,599

Claims priority, application Germany, Mar. 20, 1963, B 71,208

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 **3 Claims**

Antimicrobial compositions containing as active ingredient a compound of the formula:



wherein Z is a member selected from the group consisting of α and γ pyridyl and wherein Z carries at least one substituent selected from the group consisting of polar

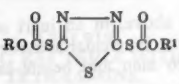
and hydrophilic substituents of hydroxy, acetoxy, carboxy, amino, acetylamino, and the N-oxides thereof, and methods of using these compositions.

3,592,902
INJECTION
Nobuyasu Sato, Itami-shi, Toshio Nakamura and Hiroshi Takenaka, Ibaragi-shi, and Eiko Watabe, Ashiya-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Higashi-ku, Osaka, Japan
No Drawing. Filed Apr. 9, 1968, Ser. No. 719,840
Claims priority, application Japan, Apr. 13, 1967, 42/23,837
Int. Cl. C07d *27/38*
U.S. Cl. 424—266 4 Claims

A stable injection of an indolylaliphatic acid derivative such as N-(p-chlorobenzoyl)-2-methyl-5-methoxy-3-indolylacetic acid, N-cinnamoyl-2-methyl-5-methoxy-3-indolylacetic acid or N-nicotinoyl-2-methyl-5-methoxy-3-indolylacetic acid is prepared by dissolving the indolylaliphatic acid derivative in a non-aqueous organic solvent for injection and adding an aqueous organic amine solution containing 0.6 to 1 mole of said organic amine per 1 mole of the indolylaliphatic acid derivative to the resultant solution. The thus obtained injection is used as an anti-inflammatory drug.

3,592,903
INSECT CHEMOSTERILANT METHODS EMPLOYING THIADIAZOLES
Philip C. Hamm, Glendale, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Oct. 23, 1967, Ser. No. 677,074
Int. Cl. A01n *9/22*
U.S. Cl. 424—270 2 Claims

Compounds of the following formula are insect chemosterilants:



wherein R and R^1 are alkyl of not more than 4 carbon atoms.

3,592,904
METHOD OF TREATING INFLAMMATORY DISEASES
Delme Evans, Sandhurst, England, assignor to Lilly Industries, Ltd., London, England
No Drawing. Filed July 7, 1969, Ser. No. 839,682
Claims priority, application Great Britain, July 5, 1968, 32,276/68
Int. Cl. A61k *27/00*
U.S. Cl. 424—270 9 Claims

A method of treating various conditions involving inflammation and its concomitant, swelling, tenderness, decreased mobility, pain, and fever, employing a substituted 2-acylaminothiazole as the active anti-inflammatory agent.

3,592,905
THERAPEUTIC METHODS
Tsung-Ying Shen, Westfield, Conrad P. Dorn, Jr., Plainfield, Robert L. Bugianesi, Colonia, and Leonard E. Olen, Clark, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Filed Oct. 3, 1969, Ser. No. 872,733
Int. Cl. A61k *27/00*
U.S. Cl. 424—270 2 Claims

Anti-inflammatory compositions containing a thiazolidine-4-carboxylic acid, ester or amide as an active ingredient.

3,592,906
SUBSTITUTED BENZIMIDAZOLES IN TREATING MAREK'S DISEASE
Tsung-Ying Shen, 858 Willow Grove Road, Westfield, N.J. 07096, and Theodore A. Maag, 16 Dellwood Lane, New Shrewsbury, N.J. 07724
No Drawing. Filed Mar. 24, 1969, Ser. No. 809,969
Int. Cl. A61k *27/00*
U.S. Cl. 424—273 7 Claims

The use of bis-benzimidazoles in reducing mortality and decreasing lesion incidence of poultry exposed to Marek's disease and to compositions comprising the bis-benzimidazoles active ingredients are provided. More specifically, the invention relates to the use of the D,L, meso, and racemic stereoisomers of lower alkyl and lower alkoxy substituted benzimidazole compounds and soluble salts thereof as treatment against Marek's disease.

3,592,907
SUBSTITUTED BENZO(b)THIOPHENE COMPOSITIONS
Arthur D. Chandler, Jr., and Herbert J. Florestano, Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Mar. 6, 1968, Ser. No. 710,750
Int. Cl. A61k *27/00*
U.S. Cl. 424—275 9 Claims

Compositions comprising at least fifty percent of a polyethylene glycol diester carrier, such as polyethylene glycol 400 dilaurate, and an antimicrobial amount of a substituted benzo(b)thiophene compound, such as methyl 5-chloro-3-hydroxybenzo(b)thiophene-2-carboxylate, are useful for the control of fungal organisms.

3,592,908
METHODS FOR TREATING COUGH AND EXPECTORATION WITH α-PINENE OXIDE
Camillo Corvi-Mora, Milan, Italy, assignor to Camillo Corvi S.p.A., Piacenza, Italy
Filed Dec. 4, 1967, Ser. No. 687,643
Claims priority, application Netherlands, Dec. 9, 1966, 6617286
Int. Cl. A61k *27/00*
U.S. Cl. 424—278 3 Claims

It was found that the mixture of oxidation products of oil of turpentine owed its analeptic activity to only two substances, being α-pinene oxide, a novel compound, and its hydrolysis product sobrerol. This made possible to formulate new analeptic compositions in exact and reproducible dosages for human and veterinary application. The new compositions having α-pinene oxide and/or sobrerol in pure form as the active principle, are free from untoward side effects known in the practice of using the mixture of oxidation products of oil of turpentine as an active principle. This invention relates to analeptic compositions which are suitable for therapeutic administration, and to their shaped dosage forms such as tablets.

3,592,909
STABLE BISMUTH TRIBROMOPHENATE OINTMENT AND PROCESS OF PREPARATION
Eason G. Pritchard, P.O. Box 2506, Knoxville, Tenn. 37902
No Drawing. Filed June 24, 1968, Ser. No. 739,137
Int. Cl. A61k *9/00, 9/06*
U.S. Cl. 424—296 7 Claims

An effective ointment for the treatment of burns is bismuth tribromophenate in an oleaginous ointment base. However the composition has the disadvantage that it is

unstable and the bismuth compound does not remain in suspension. A stable suspension of bismuth tribromophenate in an oleaginous ointment base is provided herein.

3,592,910

COMPOSITIONS AND METHOD FOR CONTROLLING RELEASE OF PESTICIDES USING TERPENE POLYMERS

Arthur R. Clark and Margaret M. Clark, both of Spring Lake, N.J. 07081

No Drawing. Continuation-in-part of application Ser. No. 676,019, Oct. 18, 1967. This application Oct. 30, 1968, Ser. No. 771,975

Int. Cl. A01n *3/02, 17/00, 17/08*

U.S. Cl. 424—300 10 Claims

Liquid polyterpenes having a molecular weight of from 272 to 544 are applied to growing plants, particularly nursery stock and food crops, to provide the plants with a protective coating. The polyterpene coating inhibits the transpiration of water from the plants, enhances plant growth, and extends the life of plant nutrients and pesticides applied in combination with the polyterpenes.

3,592,911

GASTROPODICIDAL 3,4-DICHLORO-AND 3,5-DICHLORO-THIOOXANILONITRILES

John F. Olin, Ballwin, and Walter A. Darlington, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Oct. 23, 1968, Ser. No. 770,066

Int. Cl. A01n *9/12, 9/20, 9/30*

U.S. Cl. 424—304 4 Claims

Compounds characterized by a thiooxanilonitrile nucleus wherein the phenyl substituent thereof is 3,4-dichloro or 3,5-dichloro substituted, which compounds are useful as gastropodicides.

3,592,912

CONTROL OF FUNGI WITH CYANO ETHYL PHENYL CARBAMATES

Tetsuji Ishiyama, Kamakura-shi, and Keizo Hamuro, Nishinomiya-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

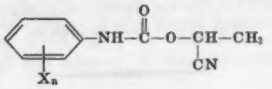
No Drawing. Original application Sept. 18, 1967, Ser. No. 668,651. Divided and this application Aug. 13, 1969, Ser. No. 867,982

Claims priority, application Japan, Sept. 22, 1966, 41/62,769

Int. Cl. A01n *5/00, 9/20, 9/24*

U.S. Cl. 424—304 2 Claims

Fungicidal composition containing inert carrier and as an active ingredient at least one of the novel compounds represented by the formula,



wherein X is chlorine or methyl; and *n* is an integer of 1 to 5, are low toxic and have high preventive and exterminative effects on such fungi as Pyricularia oryzae Cav., Cochiloborus miyabeanus (S. Ito et Kurib.) Drech., Gibberella fujikuroi (Saw.) Woll., Helminthosporium sigmoideum Cav., Hormodendrum sp., and Alternaria kikuchiana Tanaka. The above compounds are prepared easily and at low costs by the condensation of substituted anilines with α-cyanoethyl chlorocarbonate or of substituted N-phenylcarbamoyl chlorides with α-cyanoethyl alcohol, or by the reaction of substituted phenyl isocyanates with α-cyanoethyl alcohol.

3,592,913

FUNGICIDAL METHOD AND COMPOSITIONS THEREFOR COMPRISING 2,3,4,5,6 - PENTACHLOROBENZYLIDENE-ANILINE DERIVATIVES

Akira Fujinami, Takarazuka-shi, Katsuji Nodera, Nishinomiya-shi, Toshiaki Ozaki and Sigeo Yamamoto, Toyonaka-shi, and Yoshihiko Nishizawa, Nara-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

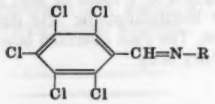
No Drawing. Filed May 16, 1968, Ser. No. 729,553

Claims priority, application Japan, May 31, 1967, 42/35,057; Aug. 4, 1967, 42/50,032

Int. Cl. A01n *9/20*

U.S. Cl. 424—304 6 Claims

Novel compounds represented by the formula,



wherein R represents a cyano-substituted lower alkyl, lower alkoxycarbonyl-substituted lower alkyl or phenyl substituted by nitro group, lower alkoxy group or lower alkoxycarbonyl group.

Said compounds are produced by reacting pentachlorobenzaldehyde with an amine of the formula:

$$R—NH_2$$

wherein R is as above, in an inert solvent. These compounds have strong fungicidal activities and are extremely low in toxicity to men and beasts as well as in phytotoxicity to crops.

3,592,914

GASTROPODICIDAL N,N'-DIARALKYL DITHIOOXAMIDES

Gerhard H. Alt and Walter A. Darlington, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Oct. 23, 1968, Ser. No. 770,067

Int. Cl. A01n *9/12, 9/20*

U.S. Cl. 424—320 6 Claims

Compounds characterized by a N,N'-substituted dithiooxamido nucleus, which compounds are useful as gastropodicides.

3,592,915

TREATMENT OF ANAPLASMOSIS IN ANIMALS

Paul Anthony Barrett, London, England, assignor to Burroughs Wellcome & Co. (U.S.A.) Inc., Tuckahoe, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 388,717, Aug. 10, 1964, now Patent No. 3,382,275, dated May 7, 1968. This application Mar. 6, 1968, Ser. No. 710,789

Claims priority, application Great Britain, Aug. 10, 1963, 31,673/63

Int. Cl. A61k *27/00*

U.S. Cl. 424—323 8 Claims

A method for the treatment of anaplasmosis in cattle, comprising the intravenous or oral administration of an effective dosage of α-ethoxyethylglyoxal dithiosemicarbazone to the infected animal.

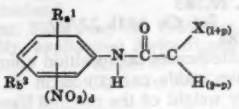
3,592,916

CERTAIN 2-HALOACETANILIDES AS GROWTH PROMOTANTS

Gino J. Marco, 610 Lilac Ave., Webster Groves, Mo. 63119, and Ernest G. Jaworski, 12 Stacy Drive, Olivette, Mo. 63132

No Drawing. Filed Sept. 7, 1967, Ser. No. 665,975
Int. Cl. A61k 27/00
U.S. Cl. 424—324 10 Claims

Animal feed composition containing at least one growth promoting compound of the formula



wherein X is halogen (Cl, Br, F and I); *p* is an integer from 0 to 2 inclusive; R^1 is selected from the group consisting of alkyl, alkenyl and alkoxy of not more than 4 carbon atoms; *a* is an integer from 0 to 5; R^2 is halogen, (Cl, Br, F and I); *b* is an integer from 0 to 3, and *d* is an integer from 0 to 2.

3,592,917

ANIMAL FEED COMPOSITIONS AND METHODS

Ernest G. Jaworski, Olivette, and Gino J. Marco, Webster Groves, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Sept. 7, 1967, Ser. No. 666,000
Int. Cl. A61k 27/00
U.S. Cl. 424—324 24 Claims

2-haloacetanilides have been found to promote the growth of animals when used alone and in animal feed compositions.

3,592,918

CONTROLLING BACTERIA WITH A FATTY TETRAAMINE

Wayne W. Havers, Broadview, Ill., and Jack de la Torre, Geneva, Switzerland, assignors to Armour Industrial Chemical Company, Chicago, Ill.

No Drawing. Filed Aug. 29, 1968, Ser. No. 756,304
Int. Cl. A01n 9/20
U.S. Cl. 424—325 3 Claims

Fatty tetraamines are used alone or in admixture with other specified compounds as biocides for various purposes.

3,592,919

PHARMACEUTICAL COMPOSITIONS AND METHODS FOR CONTROLLING INFLUENZA VIRUS INFECTION UTILIZING 1-AMINOBICYCLOOCT-2-ENES AND BICYCLOOCT - 2-ENE-1-METHYLAMINES

James C. Kauer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 763,930, Sept. 30, 1968, which is a division of application Ser. No. 536,996, Mar. 24, 1966, now Patent No. 3,418,369. This appplication May 7, 1969, Ser. No. 825,125
Int. Cl. A61l 27/00
U.S. Cl. 424—325 16 Claims

This invention relates to pharmaceutical compositions containing a compound of the class of 1-aminobicyclo-oct-2-enes and bicyclooct-2-ene-1-methylamines and the use of such compounds to control influenza viral infection in warm-blooded animals. Typical compounds useful in these compositions and methods are 4-methylbicyclo(2.2.2)oct-2-ene-1-amine hydrochloride and 4-methylbicyclo(2.2.2) oct-2-ene-1-methylamine hydrochloride.

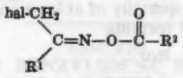
3,592,920

METHOD OF CONTROLLING BACTERIA AND FUNGI WITH CERTAIN OXIME ESTERS

Arnold D. Gutman, San Rafael, and Don R. Baker, Pinole, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed July 22, 1968, Ser. No. 746,309
Int. Cl. A01n 9/24
U.S. Cl. 424—327 13 Claims

Compounds having the formula



in which hal is chlorine, bromine or iodine, R^1 is (1) hydrogen, (2) lower alkyl, (3) aryl, (4) nuclear substituted derivatives thereof in which the substituents are halogen, nitro, lower alkoxy, lower alkyl, or cyano and (5) haloalkyl, and R^2 is (1) aryl, (2) nuclear substituted derivatives thereof in which the substituents are halogen, cyano, nitro, lower alkoxy, or lower alkyl, (3) styryl, (4) nuclear substituted stryryl, in which the substituents are halogen, cyano, nitro, lower alkoxy or lower alkyl, (5) benzyl, (6) nuclear substituted benzyl in which said substituents are halogen, cyano, nitro, lower alkoxy or lower alkyl, (7) phenethyl, (8) nuclear substituted phenethyl in which the substituents are halogen, cyano, nitro, lower alkoxy, or lower alkyl, (9) cycloalkyl having 3 to 6 carbon atoms, and (10) furyl are used as herbicides, acaricides and for controlling fungi and bacteria.

3,592,921

TREATMENT OF INTESTINAL HELMINTHIASIS WITH CYCLOPENTENE-1,3-DIONES

Alvin Wagner and James W. Kessel, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 16, 1968, Ser. No. 784,176
Int. Cl. A61k 27/00
U.S. Cl. 424—330 22 Claims

Domestic animals afflicted with intestinal helminthiasis are treated with cyclopentene-1,3-diones having hydrogen or halogen atoms at the 4 and 5 positions and substituted at the 2 position with benzylidene, dihalomethylene, or diaminomethylene radicals. The active agent can be administered in pill or capsule form or as a drench but is preferably incorporated in the feed and/or water supplied to the animal.

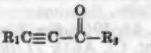
3,592,922

PROCESS OF KILLING FUNGI AND NEMATODES WITH ACETYLENIC KETONES

Dalta W. Gier and Audra M. Calhoon, Laurinburg, N.C., assignors to Chemagro Corporation, New York, N.Y.

No Drawing. Original application Oct. 16, 1967, Ser. No. 675,318. Divided and this application July 16, 1968, Ser. No. 761,965
Int. Cl. A01n 9/24
U.S. Cl. 424—331 6 Claims

Compounds of the formula



where R_1 is ethyl or phenyl and R_2 is lower alkyl, phenyl, alkylphenyl, benzyl, halophenyl, alkenyl, phenylethenyl or halophenoxymethyl are useful as nematocides and fungicides. The compound 3-heptyn-5-one is particularly valuable since it is not toxic to plants.

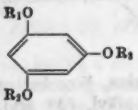
3,592,923

PHLOROGLUCINOL ETHERS

Madeleine Vaille, born Penciolelli, Brunoy, France, assignor to Societe Anonyme dite: Orsymonde, Paris, France

No Drawing. Filed Sept. 15, 1969, Ser. No. 858,114
Claims priority, application Great Britain, Sept. 17, 1968, 44,189/68
Int. Cl. A61k 27/00
U.S. Cl. 424—340 8 Claims

A pharmaceutical composition having antispasmodic and hypercholeretic properties, comprising an inert carrier and an effective quantity of at least one phloroglucinol ether of the general formula



in which R_1, R_2 and R_3 are the same or different and each represents a hydrogen atom or an alkyl group having up to 3 carbon atoms, with the proviso that at least one of R_1, R_2 and R_3 is an alkyl group and that, when each of R_1, R_2 and R_3 is an alkyl group, they are the same and each has 2 or 3 carbon atoms.

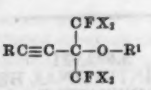
3,592,924

METHOD FOR COMBATING MICRO-ORGANISMS

Arleen C. Pierce, New Brunswick, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Oct. 21, 1966, Ser. No. 588,319
Int. Cl. A01n 9/00, 9/24
U.S. Cl. 424—342 15 Claims

Compositions comprising ethynyl compounds of the formula:



wherein R is H or Cl; R^1 is H or alkyl having from 1–5 carbon atoms inclusive and X is independently selected from the group consisting of H, F and Cl, are effective in combating micro-organisms.

3,592,925

ANTIBIOTICS AH272α_2 AND AH272β_2 AND PROCESS FOR PRODUCING SAME

Ralph Henry Evans, Jr., River Vale, N.J., and Samuel Owen Thomas, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 21, 1969, Ser. No. 817,890
Int. Cl. A61k 21/00
U.S. Cl. 424—119 10 Claims

This disclosure describes two new antibiotics, designated AH272α_2 and AH272β_2, produced in a microbiological fermentation under controlled conditions using a new strain of *Streptomyces platensis* and mutants thereof. The new antibiotics are active against gram-positive bacteria and thus are useful in inhibiting the growth of such bacteria wherever they may be found.

3,592,926

ANTIFUNGALS BK217β AND BK217γ AND PROCESS FOR PRODUCING SAME

Ping Shu, Pomona, N.Y., and Ferdinand Barbatschi, Kankakee, Ill., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 14, 1969, Ser. No. 815,806
Int. Cl. A61k 21/00
U.S. Cl. 424—120 8 Claims

This disclosure describes two new antifungals, designated BK217β and BK217γ, produced in a microbiological fermentation under controlled conditions using a new strain of *Streptoverticillium cinnamoneus* and mutants thereof. The new anti-fungals are active against a variety of fungi and thus are useful in inhibiting the growth of such fungi wherever they may be found.

3,592,927

PRODUCTION OF CALCIUM PANTOTHENATE COMPOSITIONS

Maximilian Koffler, Tel Aviv, and Zdzislaw B. Krawczak, Jerusalem, Israel, assignors to Koffolk Chemical Works Ltd., Jerusalem, Israel

No Drawing. Continuation of abandoned application Ser. No. 665,243, Sept. 5, 1967. This application Mar. 17, 1970, Ser. No. 20,385
Int. Cl. A61k 27/00
U.S. Cl. 424—184 2 Claims

A calcium pantothenate composition comprising a hydrophobic silicium oxide compound in an amount not exceeding 5% by weight of the calcium pantothenate.

The composition is prepared in a continuous operation in which calcium oxide is first reacted with β-alanine, the resulting calcium β-alanate is reacted without isolation with α-hydroxy-β,β-dimethyl γ-butyrolactone and a hydrophobic silicium oxide compound is then incorporated.

3,592,928

NOVEL ANTIMICROBIC COMPOSITIONS CONTAINING A NITROALKYL N - PHENYL-CARBAMATE

Richard Wessendorf, Hilden, Rhineland, Heinz Gunter Nosler, Monheim, Rhineland, and Horst Bellinger, Dusseldorf, Germany, assignors to Henkel & Cie. GmbH, Dusseldorf-Holthausen, Germany

No Drawing. Filed July 25, 1968, Ser. No. 747,453
Claims priority, application Germany, July 25, 1967, H 63,380
Int. Cl. A01n 9/20
U.S. Cl. 424—204 16 Claims

Novel compositions and method for killing bacteria and fungi having as the active ingredient a nitro alkyl-N-phenyl carbamate and to novel bromo-nitroalkyl-N-phenylcarbamates.

3,592,929

SYNERGISTIC ANTIMICROBIC AGENTS OF TWO BROMONITROALKYL N-PHENYLCARBAMATES

Heinz Gunter Nosler, Monheim, Rhineland, and Richard Wessendorf, Hilden, Rhineland, Germany, assignors to Henkel & Cie. GmbH, Dusseldorf-Holthausen, Germany

No Drawing. Filed July 25, 1968, Ser. No. 747,452
Claims priority, application Germany, Nov. 7, 1967, H 64,376; Dec. 7, 1967, H 64,694
Int. Cl. A01n 9/20
U.S. Cl. 424—204 9 Claims

Synergistic antimicrobic compositions comprising as the active ingredient a mixture of 2-bromo-2-nitrobutyl-N-phenylcarbamate and 2-bromo-2-nitrobutyl-N-(3,4-dichlorophenyl)-carbamate.

3,592,930

MOISTURE-DETERIORATABLE TOPICAL MEDICAMENTS, PARTICULARLY ANTI-INFLAMMATORY STEROIDS, IN A SUBSTANTIALLY NON-AQUEOUS FATTY ALCOHOL-PROPYLENE GLYCOL VEHICLE

Martin Katz, Atherton, Calif., and Herbert M. Neiman, Philadelphia, Pa., assignors to Syntex Corporation, Panama, Panama

No Drawing. Filed July 19, 1968, Ser. No. 745,989
Int. Cl. A61k 9/10, 17/06, 27/10
U.S. Cl. 424—243 10 Claims

A substantially non-aqueous medicant vehicle containing from 15 to 45 parts saturated fatty alcohol having from 16 to 24 carbons, from 55 to 85 parts glycol solvent, from 0 to 10 parts plasticizer, from 0 to 10 parts coupling agent, 0 to 20 parts penetrant, and if desired, other pharmaceutical adjuvants. This base is a suitable vehicle for

all types of therapeutic agents for topical application including antibiotics, steroids, antihistamines, antiseptics, anesthetics, antibacterials, fungicides, and the like. The vehicle has shown particular advantages with anti-inflammatory topical corticoids.

3,592,931

PREPARATIONS FOR COMBATING HARMFUL MICROORGANISMS

Max Duennenberger, Frenkendorf, and Max Schellenbaum, Muttenz, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed May 28, 1968, Ser. No. 732,527
Claims priority, application Switzerland, June 16, 1967, 8,580/67
Int. Cl. A01n *9/24*
U.S. Cl. 424—311 **6 Claims**

Preparations for combating harmful microorganisms containing as active ingredient 2,4'-dihydroxy-3',5'-ditertiary butyl-diphenylketones-(1,1') carrying a substituent in the 4-position.

3,592,932

N-2-ETHYLHEXYL-N'-ARYL UREAS AS ANTIBACTERIAL AGENTS

Dieter Duerr, Bottmingen, Hans Rudolf Hitz, Muttenz, Max Duennenberger, Frenkendorf, and Max Schellenbaum, Muttenz, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Dec. 28, 1967, Ser. No. 694,121
Claims priority, application Sweden, Jan. 12, 1967, 417/67; Oct. 17, 1967, 14,462/67
Int. Cl. A01n *9/20*
U.S. Cl. 424—322 **3 Claims**

The present invention provides N-2-ethylhexyl-N'-arylureas which are useful as active ingredients in preparations for combating harmful bacteria.

3,592,933

TREATMENT OF INFECTIONS IN ANIMALS WITH CHLORAMPHENICOL SOLUTION

Frederick W. Kullenberg, 7620 Belmont Drive, Ralston, Nebr. 68127

Filed June 18, 1969, Ser. No. 834,276
Int. Cl. A61k *21/00*
U.S. Cl. 424—324 **5 Claims**

In the treatment of infections in the mammalian and avian orders of animals by administration of effective dosages of chloramphenicol to said infected animals, the improvement which comprises administering said chloramphenicol as a composition wherein each cubic centimeter consists essentially of:

Chloramphenicol—About 20 to 200 mg.
Niacinamide—About 5 to 10%
Ethyl alcohol—About 1 to 10%
Propylene glycol—Balance

3,592,934

PHARMACEUTICAL COMPOSITIONS AND METHODS OF CONTROLLING INFLUENZA A VIRUS INFECTION UTILIZING SUBSTITUTED ADAMANTANES AND TRICYCLO[4.3.1.1^{3,8}] UNDECANES

William W. Prichard, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 673,938, Oct. 9, 1967, which is a division of application Ser. No. 376,259, June 18, 1964, which in turn is a continuation-in-part of application Ser. No. 297,233, July 24, 1963. This application June 20, 1969, Ser. No. 835,232
Int. Cl. A61k *27/00*
U.S. Cl. 424—325 **10 Claims**

This invention relates to pharmaceutical compositions containing a compound of a class of adamantane and tricyclo[4.3.1.1^{3,8}]undecane compounds having an aminomethyl or N-substituted aminomethyl group attached to a tertiary or bridgehead nuclear carbon atom as well as the pharmaceutically acceptable salts of said class of compounds and to the use of such compositions to control influenza virus infections in warm-blooded animals. Typical compounds useful as the active ingredient in these compositions are 1-(aminomethyl)adamantane, 3-(aminomethyl)tricyclo[4.3.1.1^{3,8}]undecane, α - methyl-1 - adamantanemethylamine, 1 - (N-methylaminomethyl) adamantane, and the hydrochloride salts of the foregoing named compounds.

3,592,935

SUBSTITUTED BENZYLIDENE HYDRAZINES AS ANTI-INFLAMMATORY AGENTS

William J. Houlihan and Robert E. Manning, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Dec. 11, 1969, Ser. No. 884,312
Int. Cl. A61k *27/00*
U.S. Cl. 424—326 **4 Claims**

This disclosure relates to dihalobenzylidene hydrazines, e.g., N-(2,6-dichlorobenzylidene)-N'-amidino hydrazine. These compounds are useful as anti-inflammatory agents.

3,592,936

METHOD OF TREATMENT USING PHARMACEUTICAL COMPOSITION CONTAINING DIMETHYL SULFOXIDE

Arnold D. Marcus, Livingston, N.J., and Robert E. Dempski, Dresher, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 508,826, Nov. 19, 1965. This application Apr. 25, 1969, Ser. No. 827,456
Int. Cl. A61j *3/04;* **A61k** *9/06*
U.S. Cl. 424—337 **2 Claims**

This invention relates to a method of administering liquid dimethyl sulfoxide cutaneously and topically to humans and animals in amounts effective for therapeutic action without having the dimethyl sulfoxide run off the skin and without causing significant irritation of the skin.

The method involves administering to the surface of the skin an ionicly sensitive, semi-solid gel of (i) a mixture of dimethyl sulfoxide and water in the ratio from about 50%/50% to not more than 95%/5% by weight, (ii) carboxy polymethylene water soluble resin in an amount from about 0.1% to about 1.0% by weight of the gel composition, and (iii) a neutralizing agent selected from the group consisting of monoisopropanolamine, diisopropanolamine, triethanolamine and triethylamine in an amount from about 0.01% to about 0.3% by weight of the gel composition, with the lower concentrations of neutralizing agent being employed with the lower concentrations of resins; and then maintaining the semi-solid gel in contact with the skin for a period sufficient to enable the salt normally present at the surface of the skin to gradually break the semi-solid gel composition and thereby slowly release the liquid mixture of dimethyl sulfoxide and water over the surface of the skin where the semi-solid gel was applied.

3,592,937

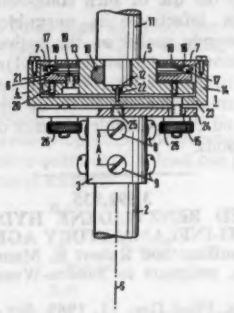
DEVICE FOR CRUCIBLE-FREE OR FLOATING ZONE MELTING OF A CRYSTALLINE ROD

Reimer Emeis, Ebermannstadt, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Dec. 6, 1967, Ser. No. 688,605
Claims priority, application Germany, Dec. 7, 1966, S 107,302
Int. Cl. B01d *9/00*
U.S. Cl. 23—273 **8 Claims**

In device for floating zone melting a crystalline rod including a removable holder mounted on the end of a sub-

stantially vertical holder shaft for end-supporting a substantially vertical crystalline rod coaxial to the holder



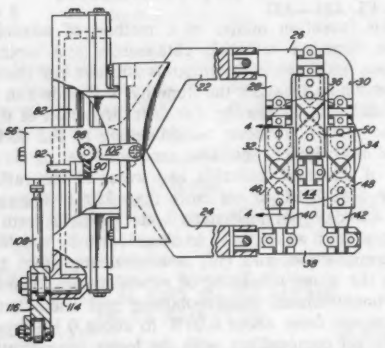
shaft, the improvement therein comprising separate means for respectively preventing radial displacement of the end holder and angular deviation thereof relative to the shaft.

3,592,938

GLASS STREAM CUTTING APPARATUS

Robert S. Bracken, Vineland, and Edward F. Parkell, Millville, N.J., assignors to Maul Bros. Inc., Millville, N.J.

Filed Apr. 29, 1968, Ser. No. 724,951
Int. Cl. C03b 5/38
U.S. Cl. 65—334 **5 Claims**



A triple gob glass feeder and a cooperating triple gob shear mechanism are disclosed. The shear mechanism has two arms reciprocable toward and away from each other. Each arm at its free end has three blades arranged in mating pairs to cooperate with each other for cutting three streams of glass from the feeder particularly when the streams are not aligned with one another.

3,592,939

METHOD OF SEPARATING METAL VALUES

Raymond Derry, Stevenage, England, assignor to Brandhurst Company Limited and Charter Consolidated Limited, both of London, England

No Drawing. Filed Apr. 10, 1968, Ser. No. 720,404
Claims priority, application Great Britain, Apr. 11, 1967, 16,591/67
Int. Cl. C22b 17/04, 23/04, 15/12
U.S. Cl. 75—108 **8 Claims**

A process for separating metal values from a mixture which includes the step of hydrogenating a mixture of the metal hydroxides at an elevated temperature and pressure such that at least one of the hydroxides is reduced to metallic form while at least one is not reduced. The metal(s) may then be separated from the remaining hydroxide(s).

3,592,940

TRIGLYCERIDE COMPOSITION CONTAINING TITANIUM DIOXIDE

Camilo Quesada, Park Ridge, Ill., assignor to SCM Corporation, Cleveland, Ohio

No Drawing. Filed Apr. 24, 1968, Ser. No. 723,902
Int. Cl. A23l 1/27
U.S. Cl. 99—148 **12 Claims**

Lipoidal compositions containing (1) a lipid suitable for application to tissues of homeothermal animals, (2) at least one partial ester of a polyol, and (3) finely divided TiO_2 are described. The compositions are advantageous in that they can be used to whiten or to increase the light reflectance of products into which they are incorporated, and are further advantageous in that they form stable aqueous emulsions.

3,592,941

METHOD FOR PRODUCING ELECTRON FLOW IN CARBONATE ELECTROLYTE FUEL CELL

Eugene B. Shultz, Jr., Ballwin, Mo., and Leonard G. Marianowski, South Holland, Ill., assignors to American Gas Association, Inc., New York, N.Y.

Continuation of abandoned application Ser. No. 305,971, Sept. 3, 1963. This application Dec. 26, 1967, Ser. No. 693,306
Int. Cl. H01m 27/06
U.S. Cl. 136—86 **3 Claims**

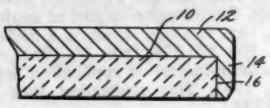
A fuel cell which utilizes hydrogen as fuel to produce electrical energy having an anode only permeable by hydrogen, a cathode permeable by an oxygen containing oxidant, and an alkaline carbonate electrolyte. The internal electril circuit utilizes only the carbonate ions from the alkaline carbonate for transporting electrons, internal of the cell, from the cathode to the anode where they are released as electrical energy. The method of producing electricity using the apparatus described comprises (1) heating the fuel cell apparatus to above the melting point of the alkaline carbonate, (2) allowing hydrogen fuel to permeate the anode and react with carbonate ions in the electrolyte thereby releasing electrons as electrical energy, and (3) providing an oxygen containing oxidant at the cathode in sufficient excess to provide oxygen atoms which combine with the carbon dioxide created at the anode and thereby produce carbonate ions at the cathode. The resultant reactions provide a carbon dioxide-carbonate ion balance internal of the fuel cell.

3,592,942

COMPOSITE CERAMIC ARMOR

Eldon W. Hauck, Worcester, and Samuel H. Coes, Northboro, Mass., assignors to Norton Company, Worcester, Mass.

Filed May 2, 1968, Ser. No. 726,121
Int. Cl. B32b 1/04, 17/06
U.S. Cl. 161—44 **4 Claims**



Presently known composite ceramic armor panels designed for protection against small arms fire consist of

dense ceramic plates adhered to a backing. According to the present invention, the preferred backing is aluminum alloy. In order to increase the beam strength of a free edge, to minimize deflection under impact and to increase the overall effectiveness of the armor, the metal backing plate is formed near the free edge into an enclosing flange or lip which extends from the backing plate at an angle of substantially 90°, adjoining the face plate and materially stiffening and strengthening the free edge.

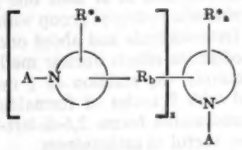
3,592,943

NOVEL PROCESSES AND COMPOSITIONS FOR ELECTROPLATING NICKEL

Frank Passal, Detroit, Mich., assignor to M & T Chemicals Inc., New York, N.Y.

No Drawing. Filed Oct. 25, 1967, Ser. No. 677,864
Int. Cl. C23b *5/08*
U.S. Cl. 204—49 16 Claims

In accordance with certain of its aspects, this invention relates to novel compositions and to an improved process for electroplating bright nickel which comprises electrodepositing nickel from an aqueous nickel-containing electroplating bath which contains (a) a first primary brightener, (b) a secondary brightener, and (c) as an additional cooperating primary brightener, a nitrogen-heterocyclic compound of the formula:



wherein each

is independently a pyridine, quinooline or isoquinoline nucleus; each *a* is an integer 0–6; each A is independently oxygen (O) or the group —OR′SO_3M wherein R′ is a divalent hydrocarbon group of 1–12 carbon atoms and M is hydrogen, a nitrogen atom, or a bath-compatible metal cation; R is a divalent group containing 1–12 carbon atoms; *b* and *x* are integers 0–1; A is

—OR′SO_3M

when x=0; and R* is a substituent selected from the group consisting of alkyl, hydroxyalkyl, halogen, alkoxy, carboxyl, carbalkoxy, acetyl, sulfo, carboxamide, cyano, aralkyl, alkaryl, and aryl; all unsubstituted carbon atoms are bonded to hydrogen atoms; and, when x=0 and A is —OR′SO_3M, (d) a secondary auxiliary brightener.

3,592,944

BOROHYDRIDE-SULFITE REDUCING AGENT FOR DYEING

Dieter Rudolf Goerrig, Auf der Hardt, Germany, assignor to Ventron Corporation, Beverly, Mass.

No Drawing. Filed May 6, 1968, Ser. No. 727,007
Claims priority, application Germany, May 9, 1967, G 50,049
Int. Cl. C01b *35/00, 6/08;* C09b *67/00*
U.S. Cl. 252—188 3 Claims

A method for producing useful solutions for reducing dyes with the aid of borohydrides is characterized by reacting a solution of alkali metal borohydrides with solutions of sodium salts of sulfur and then reacting this with about 1 mol of CH_2O per mole of $Na_2S_2O_4$, whereupon the solution is mixed with further borohydrides.

3,592,945

SOFT-GELATINE CAPSULES WITH INCREASED HEAT RESISTANCE AND METHOD OF THEIR PRODUCTION

Christel Engelking, Pesch, near Cologne, Germany, assignor to A. Nattermann & Cie GmbH, Cologne-Braunsfeld, Germany

No Drawing. Filed Mar. 7, 1968, Ser. No. 711,228
Claims priority, application Germany, Mar. 7, 1967, N 30,128
Int. Cl. B01j *13/02;* A61k *9/04;* B44d *1/14*
U.S. Cl. 252—316 4 Claims

Described are soft-gelatine capsules with increased thermostability. The capsules are provided with a protective coating comprising a copolymer of methacrylic acid and methylmethacrylate whose acid number is between 180 and 350 and whose molecular weight is between 110,000 and 160,000. A softener such as dibutylphthalate and castor oil may be added. Also described is a process of preparing these capsules.

3,592,946

FLEXIBLE AMINE-EPOXIDE RESIN AND THE CONTROLLED TEMPERATURE PREPARATION THEREOF

James R. Griffith, Riverdale Heights, Md., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Mar. 5, 1968, Ser. No. 710,622
Int. Cl. C03g *30/04*
U.S. Cl. 260—47EP 5 Claims

An elastomeric solid amine-epoxide resin is prepared from N,N′-dimethylethylenediamine and resorcinol diglycidyl ether. Preparation of the elastomeric resin involves mixing the diamine and diglycidyl ether in proportions to provide an amine hydrogen atom for each epoxy group of the diglycidyl ether, cooling the mixture before vigorous reaction takes place to cause it to be at a temperature of about 5° C., holding the mixture at such a temperature for about 5 hours, and subjecting the resulting partially reacted mixture to heat at room temperature to form a viscous liquid amine-epoxide resin. The viscous liquid resin is cured by heating at an elevated temperature to provide the elastomeric solid resin which is useful as an adhesive, a coating, or as a casting resin.

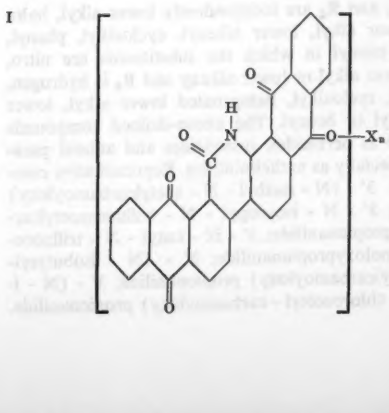
3,592,947

HALOGENATED VAT DYESTUFF OF THE DIPHTHALOYL PHENANTHRIDONE SERIES

Charles W. C. Stein, Westfield, N.J., assignor to GAF Corporation, New York, N.Y.

No Drawing. Filed Dec. 27, 1967, Ser. No. 693,753
Int. Cl. C07d *39/02*
U.S. Cl. 260—272 4 Claims

An olive green vat dyestuff of relatively low infra-red reflectance having the formula:



wherein X is nuclearly substituted bromine or chlorine; and *n* has an average value of 1 to 4.

3,592,948

ADDITION REACTION INVOLVING DIPEROXYFUMARATE TO FORM COMPOUNDS HAVING DIPEROXYSUCCINYL GROUPS

Richard Anthony Bafford, Tonawanda, Ernest Rudolf Kamens, Buffalo, and Orville Leonard Magell, Kenmore, N.Y., assignors to Pennwalt Corporation

No Drawing. Filed Mar. 8, 1968, Ser. No. 711,502

Int. Cl. C07c *69/00*

U.S. Cl. 260—453 **11 Claims**

A diester of diperoxyfumaric acid is reacted at its double bond with an organic compound R—$(X)_s$ where X is a monovalent atom readily abstractable by a free radical, e.g., hydrogen, chlorine or bromine, and R is inert to the peroxycarbonyl groups of the diperoxyfumarate to form an addition product including at least one diester of a substituted diperoxysuccinic acid. For example: Tetrahydrofuran and di-t-butyl diperoxyfumarate react at about 0° C. to form di-t-butyl alpha-(2-tetrahydrofuryl)diperoxysuccinate. Polyglycols and polyvinyl ethers, alcohols, halides, etc. react to give polymers having pendant pairs of peroxycarbonyl ester groups in gamma relationship to each other.

These compounds are of especial interest in the preparation of block and graft copolymers.

3,592,949

ACYLATED ANILIDE CARBAMATES

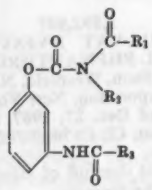
Eugene G. Teach, El Cerrito, and Julius J. Menn, Saratoga, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Mar. 29, 1968, Ser. No. 717,465

Int. Cl. C07c *125/06*

U.S. Cl. 260—479C **14 Claims**

Compounds corresponding to the formula



in which R_1 and R_2 are independently lower alkyl, halogenated lower alkyl, lower alkenyl, cycloalkyl, phenyl, substituted phenyl in which the substituents are nitro, halogen, lower alkyl or lower alkoxy and R_3 is hydrogen, lower alkyl, cycloalkyl, halogenated lower alkyl, lower alkenyl, furyl or benzyl. The above-defined compounds are effective as herbicides, insecticides and animal parasiticides, especially as anthelminthics. Representative compounds are: 3′ - (N - methyl - N - acetylcarbamoyloxy) formanilide; 3′ - N - isopropyl - N - trifluoroacetylcarbamoyloxy propionanilide; 3′ - N - butyl - N - trifluoroacetylcarbamoloxypropionanilide; 3′ - (N - isobutyryl-N - isopropylcarbamoyloxy) propionanilide; 3′ - (N - i-propyl - N - chloroacetyl - carbamoyloxy) propionanilide.

3,592,950

ALKOXYBENZYLIDENE BISPHENOLS AND THEIR ANTIOXIDANT USE

Harold D. Orloff, Oak Park, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Sept. 18, 1967, Ser. No. 668,682

Int. Cl. C07c *43/20*

U.S. Cl. 260—613 **4 Claims**

The combustion chamber deposit formation and exhaust hydrocarbon emission of internal combustion engines is reduced by operating the engine on a fuel containing an alkoxybenzylidene bisphenol such as 4,4′-(p-methoxybenzylidene)bis(2,6 - di-tert-butylphenol). These same alkoxybenzylidene bisphenols are also antioxidants.

3,592,951

PROCESS FOR ALKYLATING A PHENOL

Edward F. Zaweski, Pleasant Ridge, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Dec. 28, 1967, Ser. No. 694,107

Int. Cl. C07c *39/06*

U.S. Cl. 260—624 **5 Claims**

The reaction of from about 1 to 2 mole equivalents of a phenol unsubstituted in at least one position ortho or para to the phenolic hydroxyl group with about 2 mole equivalents of formaldehyde and about one mole equivalent of ethylenediamine effects nuclear methylation of the phenol. For example, the reaction of 2 moles of 2,6-di-tert-butylphenol with 2 moles of formaldehyde and one mole of ethylenediamine forms 2,6-di-tert-butyl-p-cresol. The products are useful as antioxidants.

3,592,952

BLENDS OF AROMATIC POLYAMIDE WITH AROMATIC POLYAMIDE-ACID AND/OR POLYIMIDE

James C. Fang, Media, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Feb. 27, 1968, Ser. No. 708,534

Int. Cl. C08g *41/04*

U.S. Cl. 260—857 **7 Claims**

Blend of a major amount of aromatic polyamide and a minor amount of an aromatic polyamide-acid and/or polyimide, useful as a coating having excellent adhesion, high impact resistance and low solvent crazing.

3,592,953

PREPARATION OF HIGH FLOW CELLULOSE DERIVATIVE REVERSE OSMOSIS MEMBRANE

William J. Ward III, Scotia, and Christopher H. Knapp, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed Oct. 2, 1967, Ser. No. 672,025

Int. Cl. B29d *7/20, 27/04*; C08b *21/04, 29/42*

U.S. Cl. 264—49 **4 Claims**

An improved method is described for the room temperature preparation of porous membranes of cellulosic derivation as, for example, are employed in reverse osmosis systems. The process provides for a two-step preparation conducted at room temperature and consisting of casting, desolvation of the film and immersion in a room temperature bath after which the membrane is ready for use. Gas phase desolvation with a controlled atmosphere enables (a) the room temperature preparation of such porous films even when highly volatile sol-

vents for the film material are employed and (b) heat treatment of the cast film either during or after immersion is obviated. In spite of the elimination of the heat curing step, the resultant porous membrane can be reproducibly prepared by this improved method to provide salt rejection of divalent ions (calcium and magnesium salts) of greater than about 90 percent at a water flux of at least about 0.7 gal./day-ft.^{2}-atm.ΔP at pressures as low as 40 p.s.i. Tests have established that over a period of at least 12 months, a slight decline was observed in the salt rejection, but the water flux remained substantially undiminished.

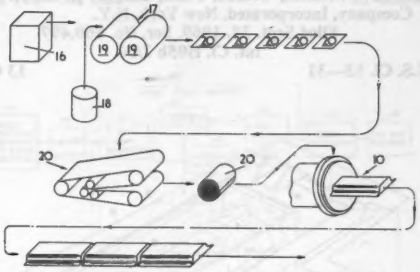
3,592,954

EXTRUSION OF TYRE LUGS CONTAINING SHREDDED METAL WIRE

Frederick Widdowson, Grantham, England, assignor to Vacu-Lug Traction Tyres Limited, Grantham, England

Filed Aug. 28, 1967, Ser. No. 663,667
Claims priority, application Great Britain, Sept. 2, 1966, 39,394/66
Int. Cl. B29c *17/14;* **B29d** *3/02;* **B60c** *9/00*
U.S. Cl. 264—108 **5 Claims**

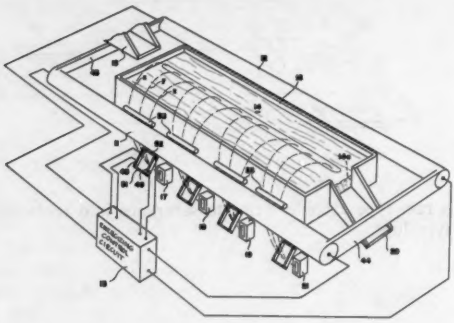
A method of producing tyre lug stock having between 3% and 5%, by weight, of discrete lengths of shredded filamentary metal wire, distributed throughout the material forming the lug stock which is extruded through



a ram type extruder prior to severance into replacement tyre lugs.

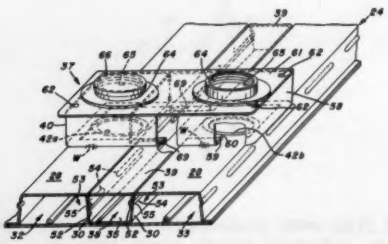
ELECTRICAL

3,592,955
ELECTRON BEAM FURNACE
Charles W. Hanks, Orinda, Calif., assignor to Air Reduction Company, Incorporated, New York, N.Y.
Filed Sept. 24, 1969, Ser. No. 860,497
Int. Cl. H05b *7/00*
U.S. Cl. 13—31 **13 Claims**



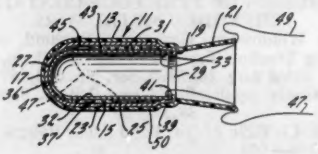
An electron beam furnace is described in which at least one electron beam is directed through a curving path to a target. The furnace employs a pair of solenoidal coils positioned to establish a substantially uniform magnetic field in the path of the electron beam, such field having generally straight lines of flux extending transversely of the electron beam path.

3,592,956
ELECTRICAL RACEWAY WIRING DISTRIBUTION SYSTEM
Frank W. Fork, Allison Park, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.
Filed May 7, 1969, Ser. No. 822,390
Int. Cl. H02g *3/28*; **E04f** *19/08*
U.S. Cl. 174—49 **12 Claims**



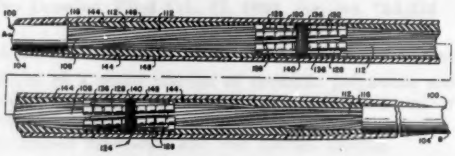
An electrical wiring distribution system including a metal raceway section having at least two parallel cells and an intermediate trough. Improved capping means is provided for enclosing the intermediate trough to provide an additional unobstructed electrical passageway. The present improvement increases the wire carrying capacity of the raceway section; utilizes a region of the metal raceway section which heretofore has been unavailable; provides separate raceways for power, telephone and signal conductors; and permits access to all three separate cells at each of plural locations in metal raceway section.

3,592,957
EXPLOSION CONNECTOR
David T. James, De Kalb, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.
Division of Ser. No. 827,130, May 21, 1969, abandoned, which is a continuation of application Ser. No. 612,655, Jan. 30, 1967, now abandoned.
Filed Jan. 26, 1970, Ser. No. 5,508
Int. Cl. H02g *15/08*
U.S. Cl. 174—87 **1 Claim**



An explosion connector for joining wires, cables, and the like, including an inner deformable shell having a bore with at least one opening into the bore to receive the wires, cables, and the like, a generally nondeformable outer shell, and an explosive located in a chamber between the shells. The outer generally nondeformable shell is folded over the inner deformable shell at the opening into the inner shell to seal the explosive-containing chamber.

3,592,958
ARMORED-AND-JACKETED SUBMARINE CABLE SPLICES AND METHOD OF PREPARING SUCH SPLICES
Paul S. Munn, Boxford, Mass., assignor to Simplex Wire and Cable Company, Cambridge, Mass.
Continuation-in-part of application Ser. No. 629,155, Apr. 7, 1967, now abandoned. This application June 19, 1967, Ser. No. 647,140
Int. Cl. H02g *15/08*
U.S. Cl. 174—88 **29 Claims**

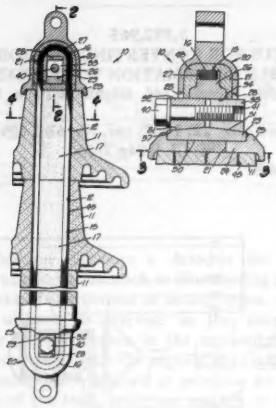


A splicing technique for connecting armored-and-jacketed cables is described. The method is particularly useful in regard to submarine cable. Single- and double-armored cables, which may or may not be caged, are spliced in such a manner as to restore the splice to the strength of the original cable. The splice itself consists of several splice positions, and the wires and splice areas are completely embedded in a rubber-like material before the outer jacket is restored.

3,592,959
PRESTRESSED ELECTRIC INSULATOR ASSEMBLY
Richard H. Dougherty, 4504 Van Alden Ave., Tarzana, Calif.
Filed Sept. 3, 1969, Ser. No. 854,884
Int. Cl. H01b *17/12*, *17/14*
U.S. Cl. 174—178 **15 Claims**

An electric insulator assembly having a ceramic main body compressively prestressed to a high degree and preferably in excess of its design load by an imbedded tensioned, multilayer loop of high-strength filament. The adjustable prestressing means comprises wedge means extending trans-

versely of one or both end caps and readily accessible for adjustment throughout the service life of the installed assembly. The passage enclosing the loop is located symmetrically of a



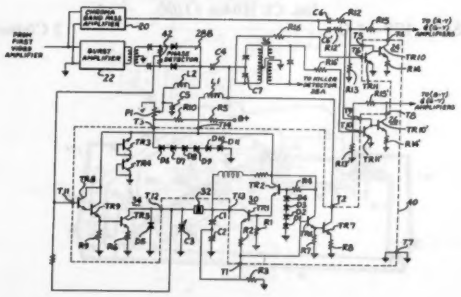
suspension insulator and asymmetrically of a cantilever-type assembly, the interior being provided with cooperating insulative filler components sealed to the loop and to the passage walls.

3,592,960

AUTOMATIC FREQUENCY CONTROL FOR AN OSCILLATOR IN A CHROMA DEMODULATION CIRCUIT

Richard W. Cushing, Forest Park; John Logeman, IV, Park Ridge, Ill., and Paul J. Whiteneir, Jr., Fort Wayne, Ind., assignors to Warwick Electronics Inc.

Filed May 27, 1968, Ser. No. 732,307
Int. Cl. H04n 9/50
U.S. Cl. 178—5.4 SD **9 Claims**



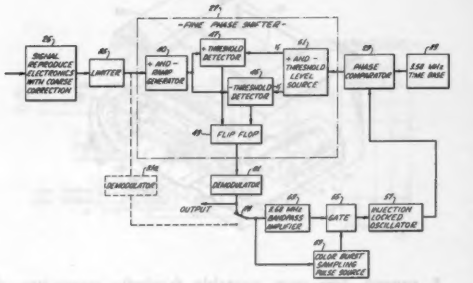
In the chroma channel of a color television receiver, a demodulator circuit for the chroma subcarrier component and an oscillator circuit for producing a control signal having the frequency and phase of the chroma subcarrier component, wherein the demodulator circuit and the oscillator circuit except for the resonant circuit portion thereof have been designed to be capable of incorporation in an integrated circuit on a single wafer of semiconductor material.

3,592,961

FINE PHASE ERROR-COMPENSATING SYSTEM AND METHOD

Alan G. Grace, San Carlos, Calif., assignor to Wistel Company, San Mateo, Calif.

Filed Dec. 18, 1969, Ser. No. 886,094
Int. Cl. H04n 9/02, 1/28
U.S. Cl. 178—5.4 CD **15 Claims**



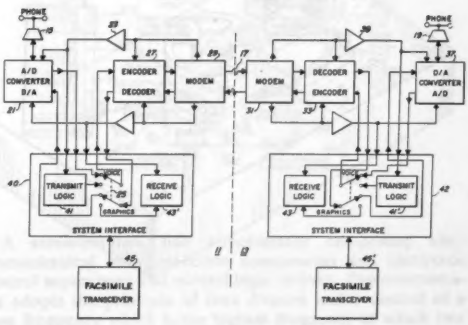
Small amounts of undesired change in the phase of a tape recorded video signal relative to a reference signal, typically caused by tape speed fluctuation, are compensated by a time delay system in which the video signal is reproduced by a lagging output signal. The amount by which the output signal lags behind the video signal is varied to compensate for the undesired phase changes of the video signal relative to the reference signal. To achieve the variable time lag, each zero crossing of the video signal is used to initiate a voltage ramp, and each voltage ramp causes the output signal to reproduce that zero crossing with a slight lag when that voltage ramp reaches a preset level, determined by the relative phases of the output signal and the reference signal.

3,592,962

FACSIMILE COMMUNICATION CONTROL CIRCUIT

Larry R. Matthews, Victor, N.Y., and Bjorn Reiseter, Billerica, Mass., assignors to Xerox Corporation, Rochester, N.Y.

Filed Mar. 9, 1967, Ser. No. 621,890
Int. Cl. H04h 7/14; H04n 1/32
U.S. Cl. 178—5.6 **6 Claims**



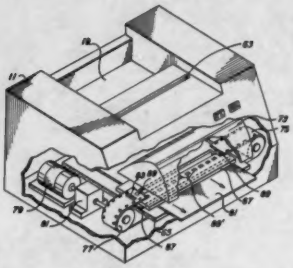
A control system for controlling the operation of a voice and graphic information transceiver communication system. Logic circuitry is selectively enabled and disabled to allow for graphic operation of a transceiver in the transmit or receive mode.

3,592,963

FACSIMILE TRANSMITTER

James E. Young, Pittsford, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed May 2, 1966, Ser. No. 546,700
Int. Cl. H04n 1/00
U.S. Cl. 178—6 12 Claims



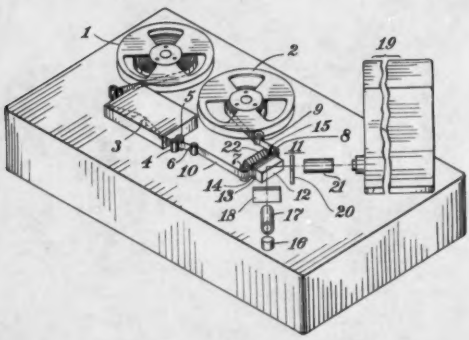
A rugged, low cost, portable facsimile transmitter for generating tone signals for transmission over telephone lines. The scanning means therein comprises an elongated fixed slit positioned transverse to the document motion direction and a multiapertured endless belt mounted for motion of the apertures lengthwise along the fixed slit. An elongated strip cell photodetector is positioned between the document and the spaced apart fixed aperture and thus light variations reflected from the document impinge upon the photodetector in accordance with the movement of the aperture belt and the information content of the document thereby scanning a beam of light from a line of the document.

3,592,964

CONVERTING IMAGES RECORDED ON A MOVING MAGNETIC MEDIUM TO STATIONARY IMAGES

Robert K. Waring, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 688,608, Dec. 6, 1967, now abandoned. This application Nov. 8, 1968, Ser. No. 777,546
Int. Cl. H04n 3/10; G11b 11/10; G02f 1/18
U.S. Cl. 178—6.6 A 27 Claims



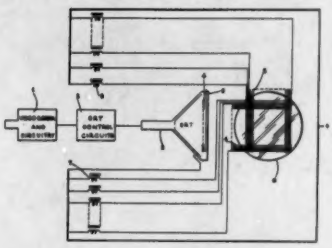
Transfer of a primary magnetic image from a moving recording medium to a stationary magnetic receptor surface is accomplished by applying a magnetic field to the receptor surface when the primary image is in the desired position relative to the receptor surface. The applied magnetic field is a decaying oscillating field or a pulsed unidirectional field, applied either parallel to the easy axis of magnetization of the receptor surface. Either periodic transfer of a sequence of images for video applications or aperiodic or single frame transfer required for microfilm readers is obtained. The applied magnetic field exceeds the coercivity of the receptor surface but not that of the moving record and is of such duration that the medium moves less than a resolution distance during transfer of the image.

3,592,965

APPARATUS FOR CONVERTING CATHODE RAY PORTRAYABLE INFORMATION TO SPACIAL IMAGES

Zaid Diaz, Cafeto Street #744, Highland Park, Rio Piedras, P.R.

Filed Aug. 22, 1967, Ser. No. 662,409
Int. Cl. H04n 3/16
U.S. Cl. 178—6.8 49 Claims



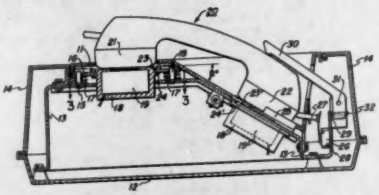
This invention relates to apparatus for converting an optical image or electrical signals obtained from scanning an image, or from other information, into an electromechanical or sensory image conforming thereto. The invention, while applicable to many fields such as printing, metal forming, image reproduction in general, and others, nevertheless will be explained in connection with a preferred embodiment thereof which enables a blind person to perceive what is ahead of him by virtue of a sensory image or outline on his skin, preferably the back or other large area.

3,592,966

ACOUSTICAL COUPLING APPARATUS

Richard C. Hansen, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Mar. 6, 1969, Ser. No. 804,880
Int. Cl. H04m 1/00
U.S. Cl. 179—1 C 3 Claims



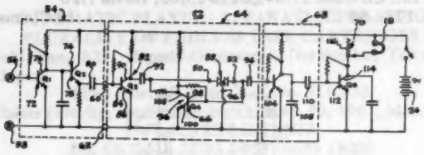
Apparatus for acoustically coupling facsimile signals through a telephone handset to a telephone network. A loading arm engageable with the telephone handset biases the telephone speaker into intimate relationship with a receive transducer adapted to convert acoustical signals into electrical signals. A send transducer for converting electrical signals into acoustical signals is biased into intimate relationship with the telephone microphone by means of a resiliently deflectable support adapted to assume variable orientation with respect to the receive transducer and the telephone speaker.

3,592,967

ULTRASONIC DETECTOR

George A. Harris, 7764 W. 14th Court, Hialeah, Fla.

Filed May 20, 1968, Ser. No. 736,917
Int. Cl. H01v 7/00; H03f 13/00
U.S. Cl. 179—1 A 4 Claims



This application discloses a detector for leaks which generate ultrasonic waves, such as illuminating gas leaks, and electrical leaks of the corona or arcing types. An ultrasonic detector is utilized to respond to the ultrasonic waves generated by the turbulence in the atmosphere caused by such leaks, and the electrical signals generated by the ultrasonic transducer are utilized to produce an indication of the presence of the leak, either an audible or visual indication.

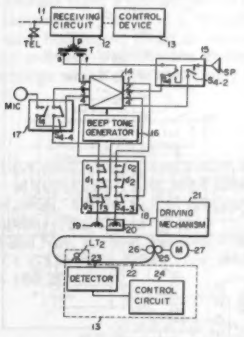
This application also discloses a band-pass ultrasonic interstage coupler employing piezoelectric elements, and a combination local oscillator and band-pass interstage ultrasonic wave coupler employing piezoelectric elements.

3,592,968

AUTOMATIC TELEPHONE ANSWERING SYSTEM WITH A FAIL SAFE ARRANGEMENT

Kenzo Ogawa, and Akihiko Suemitsu, both of Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed July 14, 1969, Ser. No. 841,297
Claims priority, application Japan, July 17, 1968, 43/49945
Int. Cl. H04m 1/64
U.S. Cl. 179—6 R 13 Claims



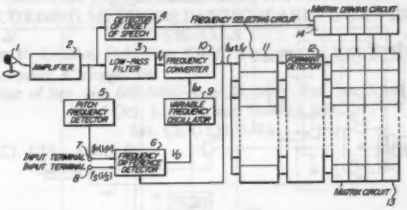
An automatic telephone answering apparatus for an absent subscriber having a receiving circuit for detecting transmitted signals, a magnetic recording and reproducing device having an endless magnetic recording tape provided with a first and second rotation indicator, and a control device composed of a first and second detectors for detecting the rotation of the tape using the first and second indicator. The apparatus also includes a control circuit for causing the magnetic recording and reproducing device to operate in the absence of the subscriber.

3,592,969

SPEECH ANALYZING APPARATUS

Hirokazu Yoshino, and Tomio Yoshida, both of Kitakawachi-gun, Osaka, Japan, assignors to Matsuskita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 22, 1969, Ser. No. 843,573
Claims priority, application Japan, July 24, 1968, May 27, 1969, 43/52897;43/43421
Int. Cl. G10l 1/00
U.S. Cl. 179—1 SA 10 Claims



One of the greatest problems tending to occur in an attempt to effect speech recognition with a speech recognition apparatus is that individual difference is present in the speech frequency distribution. Obviously, the apparatus fails to recognize a speech correctly which can naturally be recognized by the human being, if there is such individual difference.

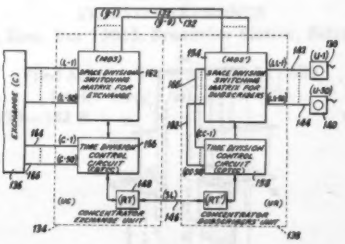
This specification discloses an apparatus wherein individual difference is eliminated from the frequency to time pattern to normalize such pattern in an attempt to effect speech recognition, thereby making it possible to achieve accurate speech recognition.

3,592,970

TIME DIVISION SELF-CORRECTING SWITCHING SYSTEM

Ilio Cappetti, and Giovanni Perucca, both of Turin, Italy, assignors to CSELT Centro Studi e Laboratori Telecommunicazioni S.p.A., Turin, Italy

Filed July 3, 1968, Ser. No. 742,295
Int. Cl. H04q 11/04
U.S. Cl. 179—18 J 9 Claims

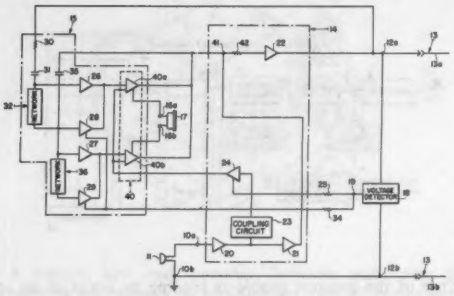

EXCHANGE (C)
SPACE DIVISION SWITCHING MATRIX FOR EXCHANGE
SPACE DIVISION SWITCHING MATRIX FOR SUBSCRIBERS
TIME DIVISION CONTROL CIRCUIT (GETES)
CONCENTRATOR EXCHANGE UNIT
CONCENTRATOR SUBSCRIBERS UNIT

A semielectronic line concentrator comprising electromechanical interconnection components and electronic control supervisory and control logic circuits. The concentrator adopts the principle of time division under control of a base frequency which is the highest frequency at which two successive operations on a plurality of stations may be performed. A second-order cycle whose frequency is a submultiple of the base frequency is used in conjunction with the base frequency. Furthermore, the system principle is arranged to be extended by the use of a third-or-more order cycle. There are control circuits responsive to these order cycles to correct automatically for errors in connections owing to noise or unexplained malfunctions.

3,592,971
EQUALIZING AND ANTISIDETONE TELEPHONE CIRCUIT

Michael C. J. Cowpland, Ottawa, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Dec. 1, 1969, Ser. No. 881,189
Int. Cl. H04m *1/58*
U.S. Cl. 179—81 A 5 Claims

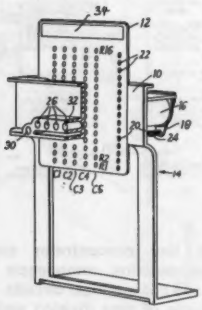


A telephone circuit which equalizes transmit and receive signals to compensate for frequency dependent signal losses in a telephone line. Equalizing amplifiers are used which have a sloped frequency response and a variable gain characteristic that is responsive to the telephone line operating voltage which is itself responsive to the length of the telephone line. A balanced amplifier is also used to drive a telephone receiver with a balanced transmit signal and an unbalanced receive signal, the balanced transmit signal effectively cancelling out across the telephone receiver to provide antisidetone.

3,592,972
CARD TELEPHONE DIALING MACHINE

Ronald George Lane, Billingshurst, Sussex, England, assignor to Sontranic Limited, Edgware, Middlesex, England

Filed Nov. 29, 1968, Ser. No. 780,104
Claims priority, application Great Britain, Feb. 26, 1968, 9266/68
Int. Cl. H04m *1/48*
U.S. Cl. 179—90 9 Claims

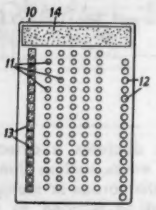


In a telephone dialing device the punched card is not driven through a chute but is dropped through a substantially vertical chute. An electromagnetically operated plunger intermittently arrests the card in the chute, causing the card to drop through the chute in a series of steps. Photoelectric cells sense successive rows of holes in the card as the card drops in successive steps through the chute to control the transmission of dialing code signals.

3,592,973
CODE CARDS FOR AUTOMATIC TELEPHONE DIALLING

Derek Keith Gray, Barnet, England, assignor to Santranic Limited, Edgware, Middlesex, England

Filed Feb. 11, 1969, Ser. No. 798,360
Claims priority, application Great Britain, May 31, 1968, 26317/68
Int. Cl. G06k *21/04*; G11b *23/00*; Ho4m *1/26*
U.S. Cl. 179—90 CS 10 Claims

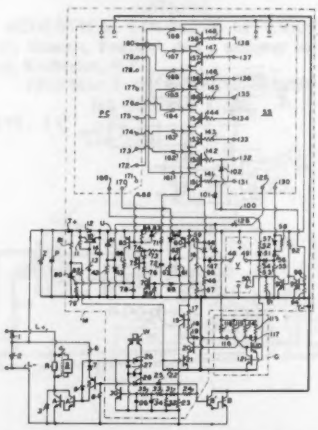


A card blank for providing a coded dialling card for card-dialling apparatus in automatic telephone systems has a plurality of recessed apertures therethrough each obscured by an opaque screen removably mounted in the recessed portions of the apertures, the maximum transverse dimensions of the screen being substantially identical with the minimum transverse dimensions of the unrecessed portion. The screens substantially prevent all direct illumination from passing through the apertures.

3,592,974
AUTOMATIC DIALING APPARATUS

Donald V. DiMassimo, Edison Township, Middlesex County, N.J., assignor to G-V Controls Inc., Livingston Township, N.J.

Filed Apr. 28, 1969, Ser. No. 819,819
Int. Cl. H04m *1/45*
U.S. Cl. 179—90 B 6 Claims



The invention is addressed to a system comprising preprogrammable apparatus, having terminals through which energy may be supplied to that apparatus to energize it, effective when energized to generate a coded series of spaced signals, a telephone line, and circuit means for connecting the terminals across that line. With that system there are combined a normally nonconductive transistor whose collector-emitter path is serially included in the circuit means above mentioned, and a means controlled by said apparatus and effective upon the energization thereof and until the conclusion of

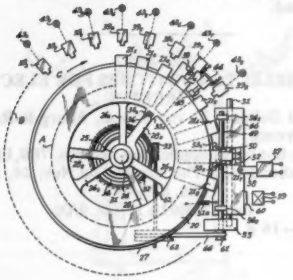
the ensuing series of signals to supply current to the base-emitter path of the transistor during the signal-preceding intervals but to open the circuit means during the signals. Energization of the apparatus is initiated by means, independent of said apparatus, for supplying a temporary initial current from the telephone line to said base-emitter path.

3,592,975

AUTOMATIC PLAYING APPARATUS UTILIZING PLURALITY OF ENDLESS TAPE CARTRIDGES

Itsuki Ban, 829, Higashi-Oizumachi, Nerima-ku, Tokyo-to, Japan

Filed Mar. 28, 1968, Ser. No. 716,833
Claims priority, application Japan, Mar. 30, 1967, Mar. 30, 1967, 42/19552; 42/19553
Int. Cl. G11b *5/54, 15/66;* **B65h** *19/06*
U.S. Cl. 179—100.2 Z **7 Claims**



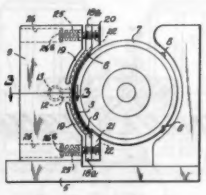
The invention is directed to an automatic and remote-controllable playing apparatus utilizing a plurality of endless tape cartridges wherein a plurality of endless tape cartridges are releasably supported within a movable housing, a stop member is operable to be remote-controlled and arranged on a cabinet correspondingly opposite each of the endless tape cartridges, said housing being adapted to be retained by actuating said stop member when a preselected endless tape cartridge is brought in the play position, a capstan is synchronously and automatically brought into abutment with a pinch roller within each of cartridges to feed and drive an endless tape for reproduction, thereafter said capstan is automatically released from the pinch roller due to an end mark signal on the endless tape, a mechanism of said stop member for arresting movement of housing is brought into free condition to allow said housing to effect its movement to thus actuate said stop member whereby the endless tape is played within the cartridge which correspondingly faces to said stop member.

3,592,976

ADJUSTABLE CONCAVE GUIDES FOR ROTARY HEAD MAGNETIC TAPE MACHINES

James J. McGinnis, Sunbury, Pa., assignor to Forglo Corporation, Sunbury, Pa.

Filed Nov. 1, 1968, Ser. No. 772,651
Int. Cl. G11b *5/52;* **H04n** *1/24;* **B65h** *23/24*
U.S. Cl. 179—100.2 **8 Claims**



A concave guide is so constructed that the shape of different portions of the guide can be adjusted to selectively change the shape and curvature of the guide. The arrangement is such that the guide can be adjustably deformed to an S-shaped curvature if desired. In the preferred embodiment the guide includes two arms projecting from a point of rigid connection with a body, adjusting screws at the ends of the arms can be manipulated to change the curvature of the arms, and a vacuum source communicates with the guide at the location of connection with the body.

3,592,977

MIRROR-IMAGE MAGNETIC INFORMATION RECORDING METHODS PARTICULARLY FOR VIDEO SIGNALS

James U. Lemke, Del Mar, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 649,540, June 28, 1967, Pat. No. 3,541,577.
Filed Oct. 2, 1969, Ser. No. 863,260
Int. Cl. G11b *5/86*
U.S. Cl. 179—100.2 E **5 Claims**

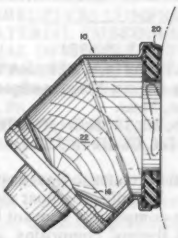
A method of producing a slant-track or transverse-scan master record on a master recording tape for subsequent copying onto a copy tape by a tape-to-tape copying process. The master tape is advanced, and at least one recording head is moved relatively to the advancing master tape along first recording tracks which extend on the master recording tape, with respect to longitudinal edges thereof, at angles which are mirror images of angles or corresponding second recording tracks required on the copy tape under a predetermined convention for playback of the information from the copy tape. Information is recorded in the mentioned first recording tracks by the one or more recording heads during their movement along the first recording tracks.

3,592,978

STEREO EARPHONES

David H. Hess, Box 15025, Broadview Station, Baton Rouge, La.

Filed Apr. 21, 1969, Ser. No. 817,689
Int. Cl. H04r *1/10;* **H04m** *1/05*
U.S. Cl. 179—182 R **6 Claims**

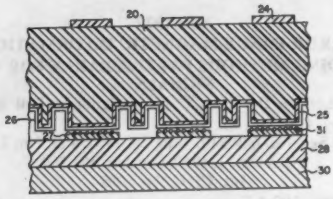


Stereo earphones having transducers positioned forwardly of the user's ears and directed rearwardly toward the ears to provide more realistic stereophonic sound effects.

3,592,979
ELASTOMERIC KEYBOARD WITH IMPROVED PRINTED CIRCUIT CONTACT MEANS

Samuel A. Redman, Garden City, N.Y., assignor to The National Cash Register Company, Dayton, Ohio

Filed Nov. 5, 1969, Ser. No. 874,198
Int. Cl. H01h *9/00, 9/26, 3/02*
U.S. Cl. 200—1 R 5 Claims

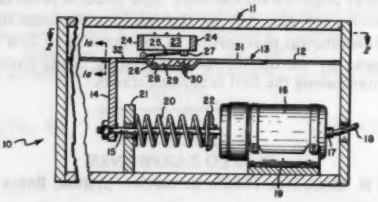


A signal-actuating device having its major component parts molded as a single piece. The actuating device includes a single body composed of an elastomeric material which is a glycol cured isocyanate terminated polyester formulated to be virtually a true gel, character symbols bonded on the body representing key positions and Mylar circuitry strips of etched copper wires bonded to raised projections located on the underside of the body. Contact made by depressing a key gives a binary-coded output, as well as providing a signal for activating distant devices.

3,592,980
PNEUMATIC STEP CONTROLLER WITH RECIPROCAL CAM MEANS

Leo Alamprese, Wooddale, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 19, 1969, Ser. No. 877,892
Int. Cl. H01h *35/26, 3/42*
U.S. Cl. 200—81.4 6 Claims



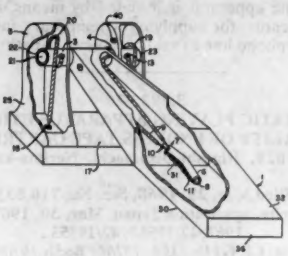
A pneumatic step controller for use in a control system where a proportional pneumatic signal is to be converted into a sequenced switching action. The step controller includes a substantially rigid, rectangular, reciprocally movable, and molded or stamped cam plate which obviates many individual cam parts and costly cam calibration.

3,592,981
FLOAT SWITCH APPARATUS

Clinton Rule, Beverly Farms, Mass., assignor to Rule Marine, Inc., Beverly Farms, Mass.

Filed Feb. 20, 1968, Ser. No. 706,886
Int. Cl. H01h *35/18*
U.S. Cl. 200—84 B 7 Claims

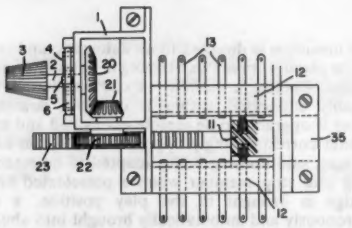
The present invention relates to float switch apparatus having unusual stability. Broadly, the float switch apparatus of the present invention comprises a buoyant lever arm having a fulcrum at one end thereof comprising a transverse shaft. Said shaft is pivotally associated with an appropriate mount. A switch means, responsive to angular deflection, is positioned within the lever arm and the conductor wires associated with said switch are routed through the transverse shaft and exit said shaft through radial apertures provided therein. Said wires then form a helical coil about said shaft and are affixed to the mount. Additionally, for greatest efficiency and stability, it is much preferred that at least the bottom, and most preferably also the top, surfaces of the lever arm be tapered.



3,592,982
ROTARY SELECTOR SWITCHES FOR ELECTRONIC CIRCUITS

Marcel Henri Deltoer, 22 rue Ravon, Bourg-la-Reine, Hauts de Seine, France

Continuation-in-part of application Ser. No. 700,119, Jan. 24, 1968, now abandoned. This application Nov. 24, 1969, Ser. No. 879,453
Int. Cl. H01h *15/00, 9/00*
U.S. Cl. 200—16 R 21 Claims

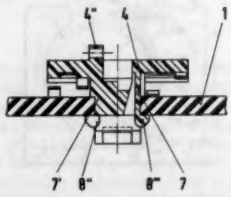


A multiple position switch in which the moving contact or contacts slide between a pair of parallel sets of fixed contacts, the movement of the moving contact being obtained from the rotation of a knob which is constrained to a plurality of circumferentially fixed positions so that step by step rotation of the knob causes adjacent pairs of fixed contacts to be bridged by the moving contact step by step.

3,592,983
IMPROVED DETENT MEANS FOR SLIDE SWITCH AND PRINTED CIRCUIT STRUCTURE

Heinz E. J. Kroll, Heroldsberg, and Rolf J. Falkner, Nurnberg, both of, Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 22, 1970, Ser. No. 30,876
Claims priority, application Germany, Apr. 24, 1969, P 19 20 784.2
Int. Cl. H01h *15/00*
U.S. Cl. 200—16 R 7 Claims



A slide switch of low profile particularly adapted for use with printed circuits. The terminals of the switch are sta-

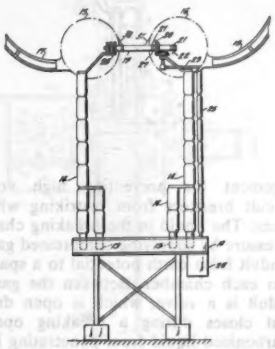
tionary conductor pattern elements of the printed circuit and the movable contact parts are carried by a slider of insulating material. The slider is mounted in a circuit board slot which serves as a track for axial slider action. A caliper type mechanism (resilient detent arm) engages detent slots in the circuit board or provides the coupling means for ganging multiple switch stages to each other.

3,592,984

ISOLATING SWITCH HAVING SPHERICAL, ELLIPSOID, TOROID OR SPHEROID ELECTRODES AND A RETRACTABLE SWITCHBLADE

Joseph A. Turgeon, Toronto, Ontario, Canada, assignor to I-T-E-Circuit Breaker (Canada) Limited, Port Credit, Ontario, Canada

Filed July 7, 1969, Ser. No. 839,456
Int. Cl. H01h *31/00*
U.S. Cl. 200—48 **9 Claims**



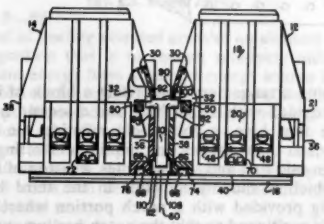
An isolating switch having spherical, ellipsoid, toroid or spheroid electrodes and a retractable switchblade. The electrodes in the open gap position have a relatively high withstand on switching voltage surge, impulse voltage and with a relatively small gap space. The extension of the retractable switchblade to contact both electrodes corresponds to the closed position of the switch while retraction of the switchblade into one of the electrodes corresponds to the open position. In that latter position, an open gap is produced between the electrodes and results in a substantially uniform electrostatic field in the gap. This has the advantage that the switch open gap may be made substantially shorter than the distance from the electrodes to ground and yet insure that any flashover will be between the electrodes and ground rather than across the switch open gap.

3,592,985

MECHANICAL INTERLOCK FOR TWO SWITCHES THAT ARE MOUNTED ON A COMMON SUPPORT

Don J. Arneberg, and Joseph J. Gribble, both of Milwaukee, Wis., assignors to Square D Company, Park Ridge, Ill.

Filed Feb. 6, 1970, Ser. No. 9,206
Int. Cl. H01h *9/20*
U.S. Cl. 200—50 C **6 Claims**



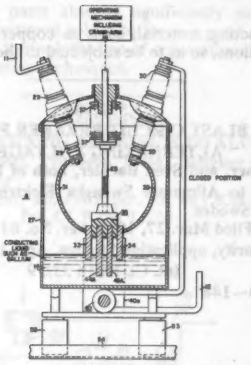
An inexpensive mechanical interlock for two switches that are mounted on a common support plate. The interlock consists of a single member which is mounted in a space between the two switches when the switches are mounted adjacent to each other on the support plate. The member has a pair of bearing portions received in recesses in the adjacent walls of the switches and a pair of actuating portions that are engaged by inclined surfaces on portions of the movable contact carriers of the two switches to prevent a concomitant operation of the switches to a circuit closing position.

3,592,986

MULTICONTACT VACUUM-TYPE HIGH-VOLTAGE CIRCUIT BREAKER UTILIZING A LIQUID METAL AND DRAWING A PLURALITY OF SERIES ARC

Russell E. Fox, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1969, Ser. No. 889,516
Int. Cl. H01h *33/66, 29/00*
U.S. Cl. 200—144 **11 Claims**



A high-voltage vacuum-type circuit breaker is provided having multiple spaced contacts, or electrodes, which are sequentially removed, or withdrawn from a pool of a liquid metal, such as gallium, or its alloys. A multiplicity of series arcs are thereby established, which are moved from the end electrodes to the adjacent surfaces of the intervening spaced electrodes. This enables a high-voltage circuit to be interrupted by the establishment of a number of arcs in series. If desirable, magnetic means may be employed to effect lateral movement of the established arcs. Gallium is particularly favorable for my circuit breaker application because of its extremely low vapor pressure in vacuum.

In another circuit breaker arrangement, an insulating rotating disc, or wheel carries a number of spokelike contacts, or electrodes, which are sequentially withdrawn from the pool of liquid metal to establish a plurality of series arcs.

3,592,987

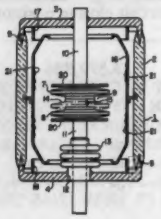
GETTERING ARRANGEMENTS FOR VACUUM-TYPE CIRCUIT INTERRUPTERS COMPRISING FIBERS OF GETTERING MATERIAL EMBEDDED IN A MATRIX OF MATERIAL OF GOOD CONDUCTIVITY

Joseph Lempert, Pittsburgh, Pa., and Gerald R. Kotler, Oak Park, Mich., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 19, 1968, Ser. No. 714,197
Int. Cl. H01h *1/00, 33/66*
U.S. Cl. 200—144 **4 Claims**

To provide a gettering action in relatively high-power vacuum-type circuit interrupters, an active gettering material, such as titanium, tantalum, columbium, zirconium, tungsten or molybdenum is incorporated in the electrode structures or interior elements of a vacuum-type circuit interrupter, so as to be subjected to the heat of the arc, which is established during circuit interruption. By the raising of the temperature of the gettering materials, or agents, their gas-absorption characteristics are activated. The gettering

materials are incorporated as filaments, or rods, either disposed randomly, or in parallel alignment in a matrix of



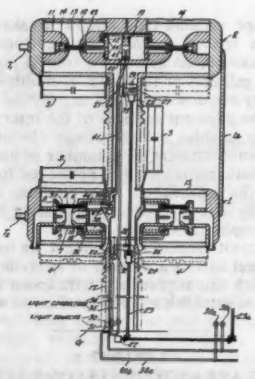
good conducting material, such as copper or silver, in the contact portions, so as to be subjected to the heat of arcing.

3,592,988

GAS BLAST CIRCUIT BREAKER FOR HIGH ALTERNATING VOLTAGES

Walter Pucher, and Sven Bachler, both of Ludvika, Sweden, assignors to Allmanna Swenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 27, 1969, Ser. No. 810,989
Claims priority, application Sweden, Apr. 1, 1968, 4338/68
Int. Cl. H01h *33/59*
U.S. Cl. 200—148 **3 Claims**



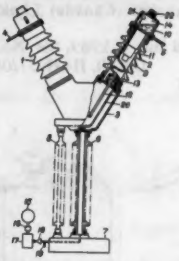
A high voltage gas blast circuit breaker is provided with series-connected pairs of contacts, one used to interrupt the circuit being protected, and the other used to close or make the circuit being protected. The contact used for circuit interruption may be operated synchronously to interrupt at or before a current zero. The contact used for closing the circuit may be operated when the instantaneous voltage across the contact is zero, thereby to prevent line voltage surges during closing. The operating circuits for the contacts are at the high voltage side of the breaker and contain a generator driven from ground by an insulation shaft. The operating circuits include a photosensitive switch which is energized by light sources located at ground potential.

3,592,989

HIGH VOLTAGE CIRCUIT BREAKER WITH PRESSURIZED BREAKING CHAMBER OF LOW LIQUID TYPE

Walter Pucher; Inge Gard, and Karl Gote Persson, all of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Dec. 26, 1968, Ser. No. 787,179
Claims priority, application Switzerland, Dec. 27, 1967, 17790/67
Int. Cl. H01h *33/68*
U.S. Cl. 200—150 **9 Claims**



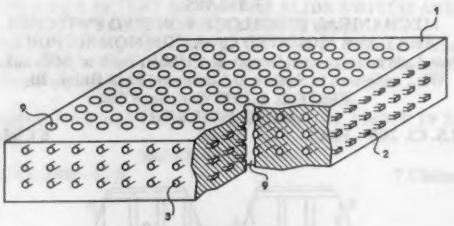
An arrangement for preventing high voltage liquid minimum circuit breakers from restriking when breaking capacitive loans. The liquid in the breaking chambers is put under high pressure by supplying compressed gas through an insulating conduit from earth potential to a space above the liquid level in each chamber. Between the gas-filled space and the conduit is a valve, which is open during normal operation but closes during a breaking operation, thus preventing carbonized liquid from penetrating into the conduit.

3,592,990

CROSSBAR SWITCHING NETWORK

Pierre M. Lucas, 20, rue Tariel, Issy-les-Moulineaux; Auguste A. Sautel, 13, rue Anatole France, Bonneuil-sur-Marne; Jacques Chauvin, 6, residence du Clos, Verrieres-le-Buisson; Serge M. Choupik, 1, rue des Fauvettes, Ris-Orangis, and Daniel J. Serezac, ilot Victor Hugo, Bretigny-sur-Orge, all of, France

Filed July 28, 1969, Ser. No. 845,254
Claims priority, application France, July 26, 1968, Mar. 7, 1969, 160,855;6,906,513
Int. Cl. H01h *29/00*
U.S. Cl. 200—152 **6 Claims**



A switching arrangement comprising a block of insulating material provided with a first hole and a second hole intersecting the first hole, a third hole meeting the first and second holes at their intersection, liquid conducting medium contained in said first and second holes, a piston of insulating material which is slidably movable in the third hole, said piston being provided with a notch portion whereby, when the piston is positioned so that the notch portion overlaps the said first and second holes at their intersection, an electrically conducting connection exists between the medium in

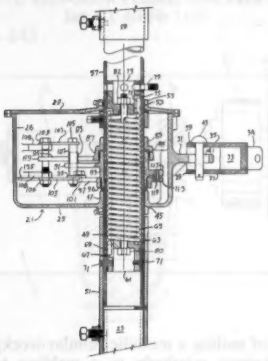
the first and second holes via the medium located in the notch portion, and, when the piston is positioned so that the notch portion does not overlap said first and second holes at their intersection, no electrically conducting connection exists between the medium in the first and second holes by virtue of the presence in the intersection of the plunger of insulating material.

3,592,991

TORQUE CONVERTER

John L. Turner, East St. Louis, and Albert J. Hoppenjans, Jr., Belleville, both of, Ill., assignors to Turner Electric Corporation, East St. Louis, Ill.

Filed June 18, 1969, Ser. No. 834,454
Int. Cl. H01h *3/38*
U.S. Cl. 200—153 V **30 Claims**



A torque converter device for producing a uniform high velocity closure of electrical air break switches and the like, comprising coaxial input and output shafts, torsionally resilient means connecting both shafts for transmitting torsional movements from the input shaft to the output shaft, latch means operable during movements of the input and output shafts in one direction (toward closure of the switch) for interrupting movements of the output shaft at a predetermined point between extreme positions thereof while permitting continued movement of the input shaft in the same (switch closing) direction, and additional means, responsive to further movements of the input shaft for releasing the interrupting means and permitting torque accumulated in the torsion spring to rotate the output shaft throughout the remainder of its travel at uniform high angular velocities. The interrupting means is automatically cocked responsive to movement of the input and output shafts in unison in the opposite (switch opening) direction.

3,592,992

SOLDERING METHOD AND APPARATUS

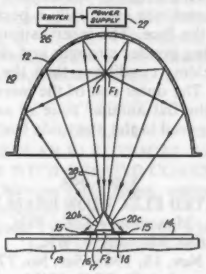
Bernard J. Costello, Ringoes, N.J., assignor to Argus Engineering Company, Hopewell, N.J.

Division of Ser. No. 561,112, June 28, 1966, Pat. No. 3,469,061.
Filed Mar. 13, 1969, Ser. No. 828,041
Int. Cl. B23k *1/04*
U.S. Cl. 219—85 **4 Claims**

A method of heating selected areas of an element having at least one portion that is to remain relatively unheated, in which radiant energy from a radiant energy source is focused upon the element by suitable reflector means, and a masking member is positioned over the protected portion to serve the dual functions of deflecting radiant energy away from the protected portion and directing the radiant energy which would otherwise strike the masked portion to impinge upon the selected areas and thereby increase the energy density upon the selected areas.

The above method may be utilized for either heating or tinning the leads of electronic devices, or soldering the leads of electronic devices to associated terminals.

In order that the soldering operation be performed rapidly and reliably, the solder may be prepared in granulated form suspended in a binder, and spread upon the selected areas to be tinned or soldered, and is exposed to the radiant energy



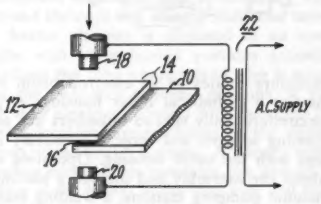
where the solder paste absorbs significantly more radiant energy than conventional solder to form a good solder joint more rapidly than through the use of conventional solder and conventional soldering techniques.

3,592,993

METHOD OF JOINING ALUMINUM TO ALUMINUM

Moreland P. Bennett, Pittsfield, Mass., assignor to General Electric Company

Filed July 15, 1969, Ser. No. 841,835
Int. Cl. B23k *11/16*
U.S. Cl. 219—93 **3 Claims**



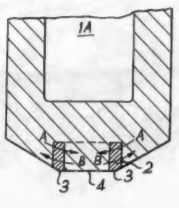
A welded joint having good electrical and mechanical characteristics is obtained between aluminum members by using a copper or copper alloy cloth or screen between the members to the joint. Heat and pressure are applied through resistance electrodes to melt the small wires of the screen and cause the aluminum metal to bond together.

3,592,994

SPOT-WELDING APPARATUS

Leslie A. Ford, London, England, assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Continuation of application Ser. No. 573,016, Aug. 17, 1966, now abandoned. This application July 25, 1969, Ser. No. 847,805
Int. Cl. B23k *9/24*; G23k *11/30*
U.S. Cl. 219—119 **6 Claims**



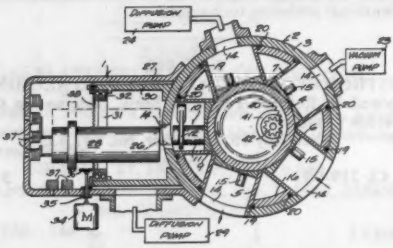
A spot-welding electrode having a tip with a flat operative contact face and an annular recess surrounding the contact

face. The portion of the electrode body which extends beyond the recess is chamfered or tapered away from the contact face. The annular insert is force fit into the recess and extends into the electrode body from the periphery of the contact face. The outer end of the insert provides a flat annular zone which surrounds the contact face and is flush with it so as to constitute essentially a peripheral reinforced flat extension of the face. The insert is formed of a conductive material having greater strength and resistance to deformation under welding conditions than the material forming the contact face. The outer end of the insert is chamfered or tapered beyond the flat annular zone so as to coincide with the chamfer or tapered in the electrode body.

3,592,995
AUTOMATED ELECTRON BEAM WELDING

John F. Hinrichs, Menomonee Falls, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Nov. 18, 1968, Ser. No. 776,405
Int. Cl. B23k *15/00*
U.S. Cl. 219—121 **5 Claims**

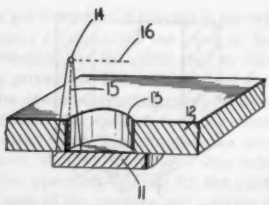


This disclosure relates to an electron beam welding apparatus having a cylindrical outer housing. A plurality of equally circumferentially spaced chambers are secured to a central rotating support and project outwardly into sealing engagement with the outer housing. Operating stations are located about the assembly and include a loading station, a pair of vacuum pumping stations, a welding station and an unloading station. The welding station includes an opening through which an electron beam gun is secured to the outer portion of the housing in alignment with the opening. The gun is mounted to rotate to establish a circular weld.

3,592,996
METHOD OF SECURING AN ELECTRICAL CONTACT TO A SUPPORT

Lawrence Norman Sayer, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 24, 1969, Ser. No. 844,290
Claims priority, application Great Britain, Aug. 9, 1968, 38064/68
Int. Cl. B23k *15/00*
U.S. Cl. 219—121 **2 Claims**

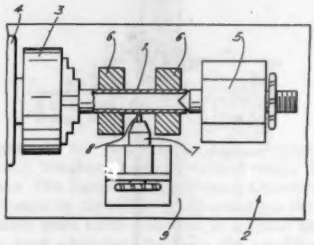


In manufacturing a movable contact for use in electrical apparatus, for example a contact breaker in a distributor, the contact is maintained in facial engagement with a support which has a lower melting point than the contact. An electron beam is then caused to traverse the contact in support in such a way that the part of the support traversed by the beam melts and an area of the contact close to the melted portion of the support is heated to a temperature between the melting points of the contact and support so that the support flows to form a joint.

3,592,997
METAL FORMING

Philip Ian Durie, Thurso, Caithness, S.C. Great Britain, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 9, 1966, Ser. No. 593,103
Claims priority, application Great Britain, Nov. 15, 1965, 48477/65
Int. Cl. B23k *9/00*
U.S. Cl. 219—137 **9 Claims**

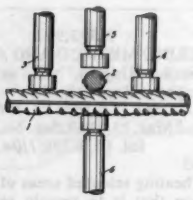


A method of sealing a metallic tubular workpiece by rotating the workpiece relatively to a welding torch arranged transversely with respect to the axis of the workpiece, the speed of rotation of the workpiece relative to the torch being increased while the current fed to the torch is reduced so that the workpiece is cut into two portions, at least one having a sealed end closure formed by recasting of the metal of the workpiece melted by the torch.

3,592,998
PROCESS FOR RESISTANCE WELDING ELEMENTS HAVING DIFFERENT MASSES

Raymond A. Derclaye, Couillet, Belgium, assignor to Societe Metallurgique Hainaut-Sambre, Societe Anonyme, Couillet, Belgium

Filed Mar. 13, 1969, Ser. No. 815,246
Claims priority, application Belgium, Mar. 27, 1968, 712.793
Int. Cl. B23k *11/16*
U.S. Cl. 219—117 **15 Claims**

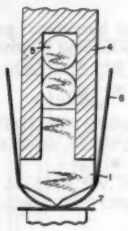


A process for resistance welding of elements having different masses, at least one of which, having a greater mass, is of naturally hard steel, includes the step of substantially subjecting, before the normal welding process, the element having the greater mass to a preheat treatment. The treatment is controlled such that, after the normal welding process, the cooling kinetics in the element having the greater mass has a value equal or lower than that of the element having the smaller mass, said kinetics being kept lower than the critical hardening rate.

3,592,999
WELDING ELECTRODE
Joseph F. Quaas, Island Park, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.
Filed Mar. 23, 1970, Ser. No. 22,054
Int. Cl. B23k 35/22
U.S. Cl. 219—146 7 Claims

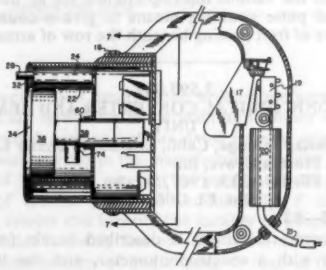
This invention relates to a coated welding electrodes which deposit upon a base metal a deposit with high wear and abrasion resistance properties. These welding electrodes have a unique core, comprising a mild steel tube and a fill of sintered tungsten carbide. The electrode coating contains a high concentration of iron bearing carbide forming elements.

3,593,000
APPARATUS FOR WELDING PLASTICS
Andre Forma, 7, Rue Livrey, 92 Levallois-Perret, France
Filed Nov. 12, 1969, Ser. No. 875,779
Claims priority, application France, Nov. 15, 1968, 17342.3
Int. Cl. H05b 1/00
U.S. Cl. 219—243 10 Claims



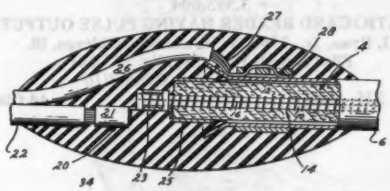
Apparatus for the welding of plastics, consisting of a pointed heating bar having faces which form an angle in the range from 15° to 35° with a plane passing through the apex and having faces adjacent the apex whose included angle is in the range from 80° to 110°.

3,593,001
STUD-BONDING GUN
William G. Simpson, and Billy K. Davis, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Dec. 31, 1969, Ser. No. 889,437
Int. Cl. H05b 1/00
U.S. Cl. 219—243 9 Claims



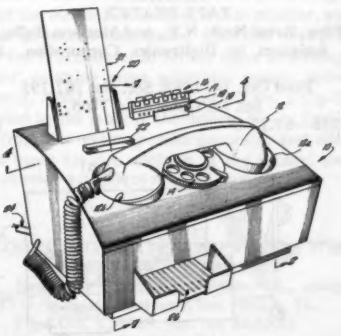
A tool for mounting and removing studs having an adhesive coated head portion and a stem extending therefrom. The tool includes an outer housing with attached handle and a stud-receiving means mounted in the housing. The stud-receiving means includes a heater for softening the adhesive on the stud, a locking device for releasably holding the stud in the tool and ejection means for ejecting the stud toward a mounting surface when the locking means is released by closing a trigger switch. Electrical contact elements mounted in the housing are actuated when pressed against the mounting surface. The contact elements are connected in series with the trigger switch to prevent release of the locking means unless the contact elements are properly actuated. This assures proper positioning of the tool with respect to the mounting surface. A heat-sensing device is provided for monitoring the temperature of the stud head portion.

3,593,002
SEALED TUBULAR ELECTRICAL RESISTANCE HEATER WITH GROUND CONNECTION
Rene D. Hebert, Chicopee Falls, Mass., assignor to Springfield Wire, Inc., Springfield, Mass.
Filed June 19, 1969, Ser. No. 834,664
Int. Cl. H05b 3/08
U.S. Cl. 219—541 2 Claims



Tubular electrical resistance heater having a flexible heater element composed of a core with a resistance wire wound helically around the core and integral unheated terminal portions. The heater element is disposed in an open ended metallic tube with its unheated portions extending from within to without the tube where a lead wire is connected to the ends of the unheated terminal portions. A conductive ground wire is in electrical contact with the outer surface of said tube at a location corresponding to the unheated terminal portions of the heater element. A unitary moisture impervious sealing material encapsulates the end of the tube, the connection of the heater to the lead wire and the connection of the ground wire to the tube.

3,593,003
DIGITAL DATA TRANSMITTER
Walter Griffin Paige, Pasadena, Calif., assignor to Burroughs Corporation, Detroit, Mich.
Filed Sept. 6, 1968, Ser. No. 757,986
Int. Cl. G06k 7/02
U.S. Cl. 235—61.11 J 18 Claims

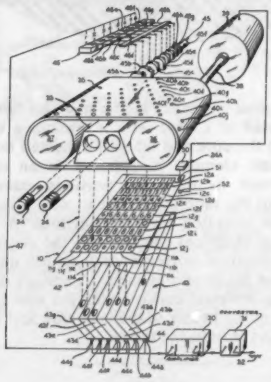


A data transmitter for reading members having positions for openings therein which are arranged into rows and

columns. A reading apparatus receives the member to be read and has an air input passage for applying streams of air to the member. An air-receiving passage is provided for each row of opening positions on a member for receiving the airstreams passing through the member. Whistles are provided for converting the streams of air to distinct tones and a transducer converts the tones to electrical signals for transmission.

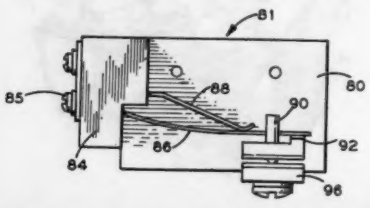
An air pump generates a plurality of airstream pulses which are applied to the member for reading purposes. The air pump contains an inner and a pair of outer compression chambers and a movable member isolating the outer chambers from the inner chamber. The movable members are simultaneously moved toward each other and simultaneously moved apart. Valves connected between the exterior of the pump and each outer compression chamber and connected between each outer compression chamber and the inner compression chamber allow air to be moved from the exterior of the pump to the inner compression chamber where the air streams are formed.

3,593,004
STATIC CARD READER HAVING PULSE OUTPUT
Le Roy J. Ryan, Jr., 5300 W. Hutchinson, Chicago, Ill.
Filed Nov. 4, 1968, Ser. No. 773,041
Int. Cl. G01m *21/30*; G06k *7/10*
U.S. Cl. 235—61.11 **14 Claims**



Optical card reader adapted to read punched information from a card having a plurality of columns of decade digital information, wherein the reader generates light pulses corresponding to the digital value of each column and converts the light pulses into electrical signals that are in turn converted into a digital output.

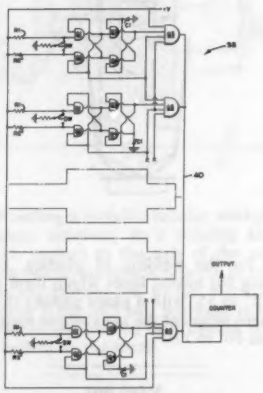
3,593,005
TAPE READER
Werner Flieg, Great Neck, N.Y., and Mariano Baffo, Woburn, Mass., assignors to Digitronics Corporation, Albertson, N.Y.
Filed Oct. 14, 1968, Ser. No. 767,295
Int. Cl. G06k *7/04*, *7/06*
U.S. Cl. 235—61.11 C **10 Claims**



This invention relates to a perforated tape reader comprising a bifurcated cantilevered mounted conductor urged toward a stationary contact by a cantilevered mounted spring, and movable away from the stationary contact against the action of the spring by a tape perforation-sensing ball restricted to vertical displacement and acting through a rod coupled to said bifurcated conductor.

In operation, normally the ball rides on the surface of a moving tape and maintains the bifurcated conductor separated from the stationary contact against the action of the cantilevered mounted spring. Upon the occurrence of a perforation, the ball moves partially through the tape, and the cantilevered mounted spring urges the bifurcated cantilevered mounted conductor into contact with the stationary contact.

3,593,006
COUNTING MECHANISM
Arthur L. McGee, San Jose; Henry N. Esterly, Cupertino, and David B. Jepsen, San Jose, all of, Calif., assignors to FMC Corporation, San Jose, Calif.
Filed Sept. 24, 1968, Ser. No. 762,087
Int. Cl. G06m *7/04*, *3/12*
U.S. Cl. 235—92 PK **15 Claims**

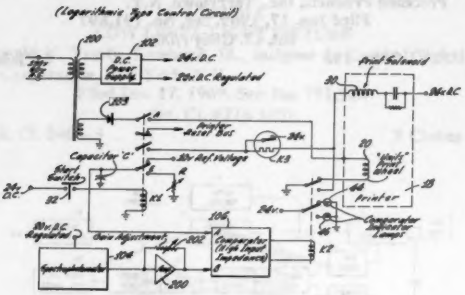


A layer of fruit in random arrangement is passed beneath a row of switch-actuating arms. Each switch serves as an input to a two-stage set-reset flip-flop circuit. A detectable pulse is created by the flip-flop circuit arrangement as a fruit leaves its associated switch-actuating arm providing that the adjacent arms are unactuated, and, consequently, only one pulse will be created for each fruit that passes beneath the row of arms as the last arm thereof drops off of it. The pulse outputs from the various flip-flop circuits are all directed to conventional pulse counting means to give a count of the total number of fruit passing beneath the row of arms.

3,593,007
ELECTRONIC DIGITAL CONVERTER AND READOUT UNIT
Lamont J. Seitz, Tujunga, Calif., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.
Filed Oct. 13, 1967, Ser. No. 675,165
Int. Cl. G06m *3/06*
U.S. Cl. 235—92 **1 Claim**

An electronic instrument is described herein for use in conjunction with a spectrophotometer, and the like, and which is capable, for example, of converting optical transmission readings of a sample under test into a logarithmic scale, so as to provide calibrated readings directly indicating the optical density of the sample at the selected wave lengths, or which may directly indicate the percent concentration of the particular impurity in the sample. The instrument in one of its embodiments, as will be described, includes circuitry for digitizing analog readings from the spectrophotometer

directly into a logarithmic scale; and it also includes a simple printer, or equivalent unit, for printing, or otherwise display-



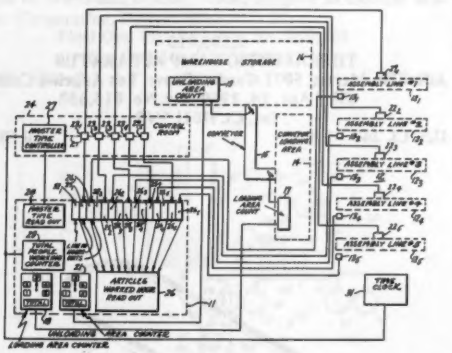
ing, the corresponding, calibrated logarithmic readings indicative of optical density or percent concentration.

3,593,008

ARTICLE/TIME RECORDING SYSTEM

David A. De Witt, and Ralph W. De Witt, both of 68 Spring Ave., Latham, N.Y.

Filed Jan. 31, 1968, Ser. No. 701,979
Int. Cl. G06g 7/52; G06f 15/24
U.S. Cl. 235—151 51 Claims



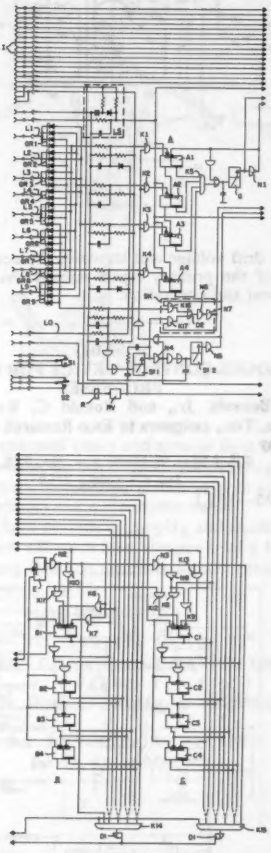
This specification describes an article/time/persons working recording system for manufacturing facilities which provides a central, continuously up-dated running account of all people hours worked in the manufacturing facility in a given interval of time, the number of people working and the number of articles produced. Additionally, if desired the recording system can identify the number of people working at a particular assembly line or other work stations together with the total number of hours being worked at that station or assembly line and the number of articles being produced by the assembly line in the given interval of time. With this information, an accurate and readily obtained up-to-date figure for the number of articles produced per work hour and/or the number of articles produced per person for the entire facility and/or any given assembly line, is instantaneously available for accounting purposes for anytime during or after a work day.

3,593,009

DEVICE FOR CHECKING OF PRECALCULATED NUMBERS

Hans-Gerd Unterschutz, and Ernst Kutschbach, Karl-Marx-Stadt, both of, Germany, assignors to VEB Kombinat Zentronik Karl-Marx-Stadt, Postschliessfach, Germany

Filed Sept. 22, 1969, Ser. No. 859,910
Int. Cl. G06f 11/10; H04l 1/10
U.S. Cl. 235—153 3 Claims



The device comprises groups of diodes for coding respective digits of the number under test, a first counter, an adjustment pulse generator connected between the groups of diodes and the first counter to set the same to a complementary number, resetting pulse generator means, second and third counters, AND and OR gate members, a flip-flop circuit controlled by the input of the device, means for inverting the pulses from the resetting pulse generator and alternately feeding the same for the addition in the second and third counter to provide a constant residual number.

3,593,010

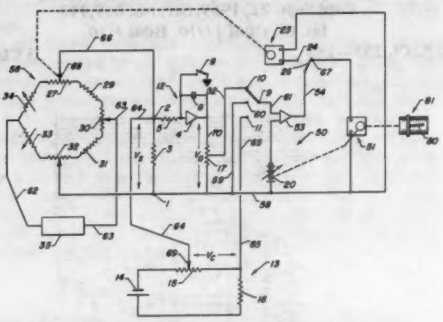
ANALOGUE INTEGRATION APPARATUS WITH COMPENSATION FOR DRIFT

Robert W. Sampson, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 6, 1969, Ser. No. 863,801
Int. Cl. G06g 7/18
U.S. Cl. 235—183 9 Claims

A primary signal network which compensates for drift error developed in a voltage-integrating network operating

on the primary signal voltage. A compensating voltage is developed in the primary signal network independent of the normal primary voltage signal. This compensating voltage

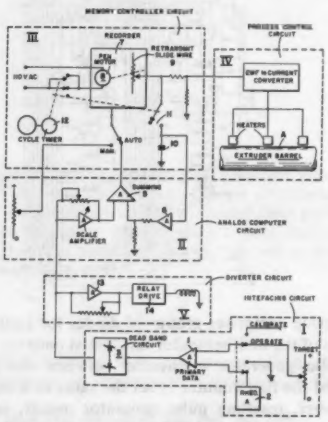


offsets the drift voltage and improves the accuracy of the integration of the primary signal voltage over the period of measurement and integration.

3,593,011
ANALOGUE CONTROL DEVICE FOR CHEMICAL PROCESSES

John O. Beauxis, Jr., and Ronald C. Kowalski, both of Baytown, Tex., assignors to Esso Research and Engineering Company

Filed May 9, 1968, Ser. No. 728,004
Int. Cl. G06g 7/58
U.S. Cl. 235—151.1 **7 Claims**

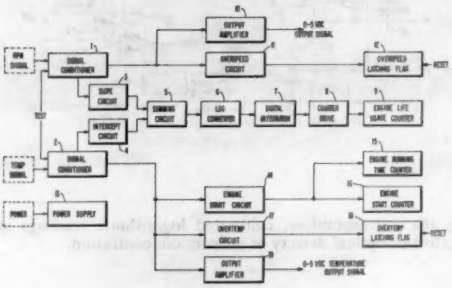


A simple analogue control device for controlling chemical processes comprises a primary interfacing circuit, and analogue computer circuit, a memory-controller, and a process control circuit. The memory-controller circuit in its most specific aspect comprises a recorder-controller, a storage device which stores the output voltage from the recorder-controller, a switch between the recorder-controller and the storage device, and a timer circuit which sequentially opens the switch between the recorder-controller in the storage device, actuates the pen motor of the recorder-controller to allow the pen to take a new position in response to the input voltage signal into the recorder-controller, deactivates the motor establishing a new output voltage proportional to the input voltage signal and closes the switch to store the new output voltage.

3,593,012
ENGINE LIFE RECORDER SYSTEM USING ENGINE TEMPERATURE AND RPM DATA

Walter T. Lang, Jackson Heights, N.Y., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Jan. 17, 1969, Ser. No. 791,897
Int. Cl. G06j 1/00
U.S. Cl. 235—193 **6 Claims**

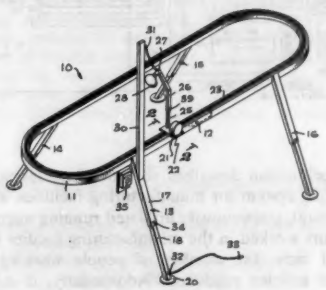


A recording system for measuring and indicating engine life usage by providing analog data representative of engine temperature and engine r.p.m., summing the analog data and converting the information into serial digital form to analog to the base 2, integrating by counting and displaying the total count as an indication of percent engine life used.

3,593,013
THERAPEUTIC LAMP APPARATUS

Alfred M. Mertes, 5071 Garden Grove, Los Angeles, Calif.

Filed Apr. 14, 1969, Ser. No. 815,650
Int. Cl. H01j 5/48
U.S. Cl. 240—1 A **10 Claims**



A therapeutic lamp apparatus is disclosed herein having a frame providing a continuous oblong track encircling and defining a treatment area on which a movable carriage is mounted. A radiating lamp is carried on the carriage via an upright boom so that the radiation therefrom is directed toward a selected portion of the treatment area and which travels in an encircling horizontal path about the treatment

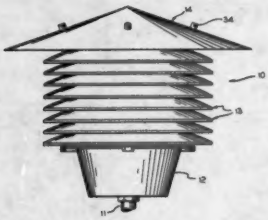
area in response to movement of the carriage on the track. Means are provided for automatically driving the carriage and for stabilizing the carriage and lamp on the track.

3,593,014

LOW LEVEL LIGHT FIXTURE

Donald V. Vesely, Lombard, Ill., assignor to General Signal Corporation, New York, N.Y.

Filed Jan. 17, 1969, Ser. No. 791,984
Int. Cl. F21p 5/00
U.S. Cl. 240—3 8 Claims



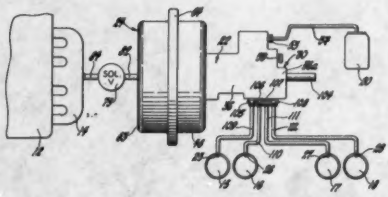
Low level light fixture for projection of usable light to all or part of the area surrounding the fixture while eliminating glare or direct light to persons walking thereby, and including a louvered construction that operates externally at temperatures not hazardous to persons touching same.

3,593,015

HEADLAMP WASHER PUMP

Joseph R. Marchant, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1969, Ser. No. 869,765
Int. Cl. B60s 1/56; B05b 1/10
U.S. Cl. 240—7.1 5 Claims



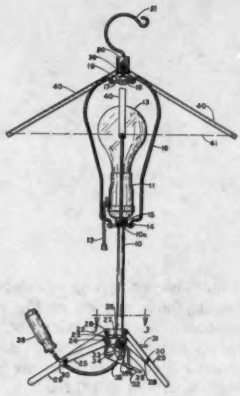
In a preferred form, this disclosure relates to a headlamp washer system for sequentially squirting washer fluid onto a plurality of spaced headlamps of an automotive vehicle. The washer system comprises a reservoir for containing a supply of washer fluid, a pump means including a movable pumping member for pumping washer fluid under pressure, valve means having an inlet in communication with the outlet of the pump means and a plurality of spaced outlet ports, and nozzle means adapted to be positioned adjacent each of the headlamps and with individual ones of the nozzles being respectively connected with individual ones of the outlet ports of the valve means. The valve means includes a valve member which is connected with the pumping member and which is movable in response to operation of the pump means to sequentially uncover the outlet ports to sequentially provide a full pressure squirt of washer fluid onto each of the headlamps.

3,593,016

CAR BATTERY OPERATED CAMP AND TROUBLE LIGHT

John P. Gerdel, 9405 E. 84th Terrace, Raytown, Mo.

Filed Oct. 2, 1969, Ser. No. 863,220
Int. Cl. B60q 1/26
U.S. Cl. 240—8.18 5 Claims



A car battery operated camp and trouble light including a stand, a foldable base, an open frame surrounding and protecting the light bulb, suspension means at both ends of the stand (top and bottom) and a removable shade.

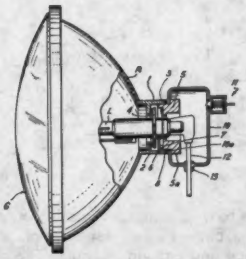
The basic idea is to provide a camping and trouble light of multiple uses which will work from the power of a 12-volt car battery by plugging into the cigarette lighter socket on the car dashboard.

3,593,017

AIRTIGHT VEHICLE HEADLIGHT HAVING ONE-WAY VALVE

Pierre Cibie, Paris, France, assignor to Projecteurs Cibie, Bobigny, France

Filed Dec. 9, 1968, Ser. No. 782,118
Int. Cl. F21m 3/00
U.S. Cl. 240—41 R 2 Claims



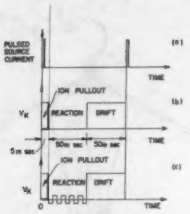
Headlight includes a reflector, having a removable bulb located at its focal point, sealed in airtight manner to a glass cover. Rear of bulb connected to a power source. A cap encloses the connection in airtight manner, the cap having a one-way valve permitting air to leave headlight but not to enter.

3,593,018

TIME OF FLIGHT ION ANALYSIS WITH A PULSED ION SOURCE EMPLOYING ION-MOLECULE REACTIONS

Martin J. Cohen, West Palm Beach, Fla., assignor to Franklin GMO Corporation, West Palm Beach, Fla.

Filed Apr. 1, 1969, Ser. No. 812,285
Int. Cl. H01j 39/34; B01d 59/44; H01j 37/08
U.S. Cl. 250—41.9 TE 19 Claims



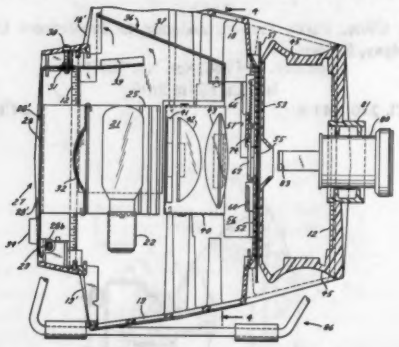
Apparatus and methods for sorting and detecting ions in a drift cell, the electric fields applied to the cell being controlled at appropriate times to minimize dispersion of bunched ions produced by a pulsed source. Bunched product ions produced by ion-molecule reactions are analyzed in accordance with their velocity in a drift field.

3,593,019

VENTILATING MEANS FOR LIGHT SOURCE FOR PROJECTOR

Eugene Martinez, Irvington-on-Hudson, N.Y., assignor to Robert H. Reibel, Croton-on-Hudson, N.Y., a part interest

Division of Ser. No. 715,621, Mar. 25, 1968, Pat. No. 3,520,599.
Filed Feb. 11, 1970, Ser. No. 10,344
Int. Cl. F21v 29/00
U.S. Cl. 240—47 19 Claims



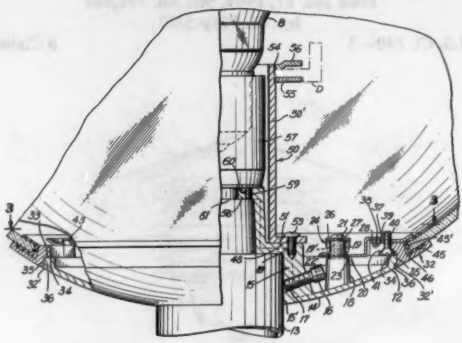
A projector having a molded plastic outer case which is supported by a curved steel stand which also serves as an elevating device and carrying handle. The projector can be tilted simply by sliding it up on the curved stand and locking it with two knobs. An electric lamp is mounted at a center location within the case and a pair of heat dissipating baffle plates are positioned on opposite sides of the lamp. A cover is positioned over the lamp and baffle plates to direct the cooling air rising adjacent the lamp toward the rear of the projector. A film advance mechanism is housed in the case and includes an arm which engages the film sprocket holes only during the advancing operation.

3,593,020

LIGHTING FIXTURE

Anthony C. Donato, Woodridge, N.J., assignor to Lightolier Incorporated, New York, N.Y.

Filed July 11, 1969, Ser. No. 841,078
Int. Cl. F21v 21/08
U.S. Cl. 240—52.1 14 Claims



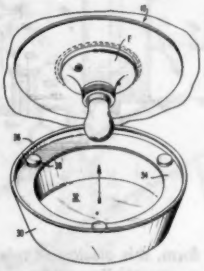
An improved lighting fixture comprising a mounting base member, a readily removable globe retainer member, the said members being interconnected by a bayonet connection which provides a degree of yielding relative movement between the mounting base and globe retainer, to render the fixture resistant to damage when exposed to high wind, vibration or shock.

3,593,021

LIGHTING FIXTURE DIFFUSER ASSEMBLY

Seymour Auerbach, 115 Hesketh St., Chevy Chase, Md.

Continuation-in-part of application Ser. No. 568,236, July 27, 1966, now Patent No. 3,388,248. This application June 3, 1968, Ser. No. 734,096
Int. Cl. F21v 17/06
U.S. Cl. 240—128 15 Claims



The lighting fixture diffuser assembly includes a circular support member having an adhesive backing and an opposite face formed of magnetic material. The support member is concentrically perforated to provide rings in graduated diameters. The rings are selectively removed to provide an opening of predetermined diameter through the support member as to locate and align the latter about light fixtures of various diameters. The support member is adhesively secured to the wall or ceiling surface about and independently of the light fixture. A diffuser carrying an inwardly directed flange adjacent its open end and mounting a plurality of magnets on the flange is applied about the support member so that the diffuser is magnetically secured to the support member. In another form, the magnetic material is provided on the diffuser flange with the magnets being secured to the support member.

3,593,022

CONTROL OF A VEHICLE ALONG A PATH DIVIDED INTO A PLURALITY OF SIGNAL BLOCKS

Robert C. Hoyler, Pittsburgh, and George M. Thorne-Booth, Murrysville, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 25, 1968, Ser. No. 762,563
Int. Cl. B61l 23/14
U.S. Cl. 246—34 R 24 Claims

A train control signalling system is provided for train speed command signals and train position detection signals, which system is operative in a fail-safe manner with a plurality of isolated track circuit blocks. For a given train system, a plurality of wayside stations is provided, with each station being operative through a limited number of conductors to energize a predetermined number of track circuit blocks. Each station includes a crystal controlled signal generator to assure an accurate coherent base frequency control of the communicated signals and provide control signals for the signal communication operation relative to each station to thereby control, in effect as an extension of the crystal control concept, accuracy to each of the associated track circuit blocks.

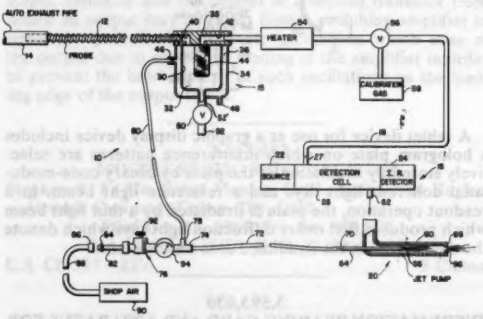
Up to 32 separated track circuit block locations receive information from each wayside station, for this particular system as described, over a common time division multiplexed signalling system, so it is necessary that each location receive its particular information only at the correct time period. This is accomplished by an appropriate control signal sent for this purpose to each track circuit block location.

3,593,023

APPARATUS AND METHOD FOR EXHAUST ANALYSIS

Michael Dodson, Fullerton, and Raymond J. Gomez, Arcadia, both of, Calif., assignors to Beckman Instruments, Inc.

Continuation-in-part of application Ser. No. 767,903, Sept. 18, 1968, now abandoned. This application Mar. 27, 1969, Ser. No. 814,509
Int. Cl. G01n 21/26, 31/00
U.S. Cl. 250—43.5 35 Claims



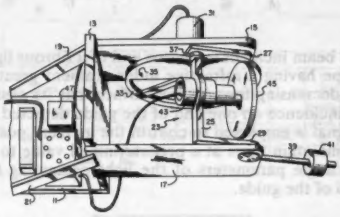
An apparatus and method for determining the content of certain constituents in hot gases, such as the exhaust of motor vehicles or the like. The exhaust gas is conveyed by a pump to an air cooled condenser to lower the temperature of the gas to essentially ambient temperature and thus condense water vapor therein. The gas is then heated to a temperature above said ambient temperature while being conveyed from the condenser through a conduit to a sample cell of a radiant energy analyzer so that water vapor in the gas passing through the conduit and cell will not condense upon the walls thereof. The cell is positioned above a water trap in the condenser a distance sufficiently great so that no water in the trap will be carried into the cell by the flow of gas passing through the apparatus. The gas is preferably conveyed through the apparatus by means of a jet pump connected to an outlet port on the cell. The jet pump embodies a restriction at its outer end to provide automatic pressure regulation in the apparatus so that the gas pressure in the sample cell will remain relatively constant regardless of pressure fluctuations in the air supply that drives the pump.

3,593,024

APPARATUS FOR OBTAINING ISOTROPIC IRRADIATION OF A SPECIMEN

Lester Katz, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Sept. 3, 1969, Ser. No. 855,004
Int. Cl. H01j 37/26, 37/20
U.S. Cl. 250—49.5 B 5 Claims



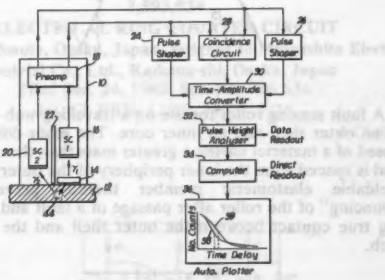
Apparatus for moving a film emulsion in a path of high-energy particles so as to obtain essentially an isotropic exposure. The apparatus rotates the film on a turntable along one axis and simultaneously shifts the turntable up and down within a limited range.

3,593,025

DETECTING DEFECTS BY DISTRIBUTION OF POSITRON LIFETIMES IN CRYSTALLINE MATERIALS

Joseph C. Grosskreutz, Prairie Village, Kans., assignor to Midwest Research Institute, Kansas City, Mo.

Filed June 14, 1968, Ser. No. 737,030
Int. Cl. G01t 1/20
U.S. Cl. 250—83.3 10 Claims



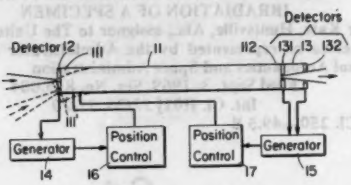
A method of nondestructively testing a structural member of crystalline material employs positrons from a radioactive source as a probe to detect the presence of latent defects in the crystalline structure of the member, such as those due to early fatigue damage or microscopic porosity. The half-life of positrons is longer in materials containing such defects than in undamaged materials; therefore, a measurement of the time of existence of positrons in a given material is effected and serves as an indication as to whether the half-life of the positrons in the material under test is longer than normal.

3,593,026

LIGHT DEFLECTION COMPENSATION DEVICE UTILIZING AN OPTICAL FIBER HAVING A REFRACTIVE INDEX GRADIENT WHICH DECREASES RADIALLY

Teiji Uchida; Motonki Furukawa, and Ryuji Tatsumi, all of Tokyo, Japan, assignors to Nippon Selfoc Company Limited, c/o Nippon Electric Company, Limited, Minato-ku, Tokyo, Japan

Filed July 7, 1969, Ser. No. 839,236
Claims priority, application Japan, July 6, 1968, 43/46958
Int. Cl. G01j 1/20; G02b 5/14
U.S. Cl. 250—201 **3 Claims**



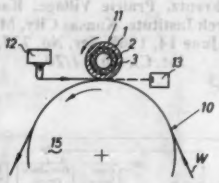
A light beam incident upon one end of a fibrous light guide of the type having a refractive index gradient greatest at its axis and decreasing towards the surface, has its position and angle of incidence on one end of the guide detected. The detected signal is employed to control the incident position and angle to maintain them at a predetermined value to fix position and angle parameters of the light emanating from the other end of the guide.

3,593,027

WEB FAULT-DETECTING APPARATUS USING ROLLER CONSTRUCTED TO PREVENT BOUNCING

Dieter Grieger, Kiel, Germany, assignor to Dr. Ing. Rudolf Hell, Kommanditgesellschaft Kiel, Germany

Filed June 24, 1969, Ser. No. 835,930
Claims priority, application Germany, June 28, 1968, H 63 183/42K
Int. Cl. G01n 21/32
U.S. Cl. 250—219 **6 Claims**



A fault sensing roller for use on a travelling web consisting of an outer shell and an inner core. The inner core is composed of a material having a greater mass than the outer shell and is spaced from the inner periphery of the outer shell by a yieldable elastomeric member thereby preventing "bouncing" of the roller after passage of a fault and maintaining true contact between the outer shell and the travelling web.

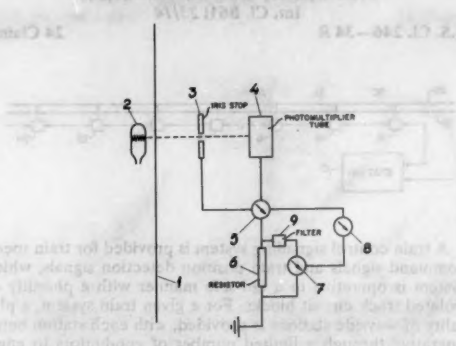
3,593,028

METHOD FOR PHOTOELECTRICALLY MEASURING WIRE MARKINGS IN PAPER TAKING RATIO OF AC TO DC COMPONENTS

Antti Lehtinen, Jyvaskyla, Finland, assignor to Valmet Oy Punanotkonkatu, Helsinki, Finland

Filed Feb. 15, 1968, Ser. No. 705,682
Claims priority, application Finland, May 10, 1967, 1344/67
Int. Cl. G01n 21/30
U.S. Cl. 250—219 **1 Claim**

A beam of light is used to measure the extent of wire markings upon a sheet of paper which was dried upon a wire mesh in a paper making machine. The beam of light is passed through a sheet of paper and then strikes a photomultiplier tube which produces an electrical current having AC and DC components. A milliammeter measures the DC component. the AC component before being measured is passed through a filter which removes from it all frequencies except the frequency consistent with the wire marking. The filter may be connected with a switch and the switch may be a selector switch to vary the frequency bands passed by the filter. An instrument which measures the ratio of the filtered AC component to the DC component can indicate as percentage the extent of the wire.

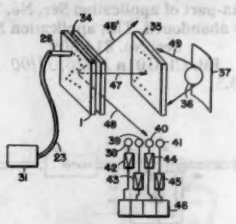


3,593,029

ANALOG TO DIGITAL CONVERTER WITH GRAPHIC DISPLAY EMPLOYING HOLOGRAPHIC TECHNIQUES

Mitsuhito Sakaguchi, and Nobuo Nishida, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Minato-ku, Tokyo, Japan

Filed Nov. 19, 1969, Ser. No. 878,142
Claims priority, application Japan, Nov. 27, 1968, 43/87218
Int. Cl. G01n 21/30; G02b 27/00
U.S. Cl. 250—219 **5 Claims**



A tablet device for use as a graphic display device includes a hologram plate on which interference patterns are selectively stored by irradiation of the plate by binary-code-modulated coherent light rays and a reference light beam. In a readout operation, the plate is irradiated by a thin light beam which produces first order diffraction light rays which denote the data stored in the irradiated area on the plate.

3,593,030

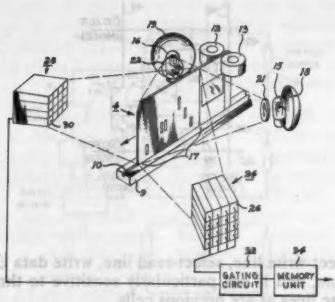
INFORMATION BEARING CARD AND APPARATUS FOR SENSING DATA THEREON

Jorg Jaskowsky, Rult Wurttemberg, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1969, Ser. No. 854,182
Claims priority, application Germany, Sept. 5, 1968, P 17 74 783.0
Int. Cl. G01n 21/30; G06k 7/00; H01j 5/02
U.S. Cl. 250—219 DC **10 Claims**

An information bearing card is disclosed as having information fields disposed on both sides of the card and further having indicia of a contrasting type disposed on each of the

fields. In addition, apparatus is provided for scanning both sides of the card at the same time and may illustratively take the form of a matrix of photoconductive elements sensitive to



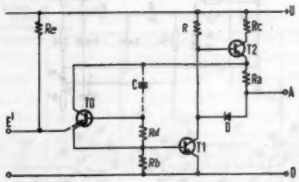
radiation reflected from the card and having transmissive portions disposed between the radiation sensitive elements to allow radiation to be directed therethrough and onto the information bearing card.

3,593,031

OUTPUT SWITCHING AMPLIFIER

Franz Jenik, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Sept. 22, 1969, Ser. No. 859,685
Claims priority, application Germany, Sept. 30, 1968, P 17 62 963.9
Int. Cl. H03k *19/40*
U.S. Cl. 307—214 **2 Claims**



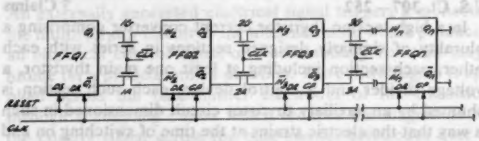
A low-ohmic resistor is connected between the collector of a first transistor and the emitter of a second transistor from which an output may be taken from a switching amplifier in order to aperiodically attenuate oscillations which arise at the output due to capacitive loading of the amplifier in order to prevent the heterodyning of such oscillations on the leading edge of the output signal.

3,593,032

MOSFET STATIC SHIFT REGISTER

Stephen P. F. Ma, Santa Monica, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 15, 1969, Ser. No. 884,926
Int. Cl. G11c *19/00*; H03k *21/00, 23/08*
U.S. Cl. 307—221 **5 Claims**



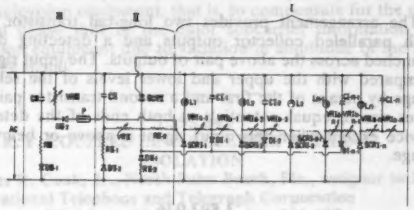
A static serial shift register of a type that can be constructed on a single semiconductor substrate with metal oxide semiconductor field effect transistor (MOSFET) techniques which has a single RS flip-flop plus two MOSFET's per stage where the MOSFET's are gated by a clock pulse to conduct the output of a preceding RS flip-flop to a subsequent RS flip-flop.

3,593,033

DEVICE FOR ENERGIZING SEQUENTIALLY PLURAL LOADS

Tetsuji Shimizu; Sinichi Ueno, and Susumu Usami, all of Nagoya, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aza-Sunairi, Oaza-Shimoodai Nishibrwajima-cho, Nishikasugai-gun, Aichi Prefecture, Japan

Filed Aug. 27, 1968, Ser. No. 755,623
Claims priority, application Japan, Sept. 19, 1967, 42/59631
Int. Cl. H03k *21/00, 17/00*
U.S. Cl. 307—223 B **3 Claims**



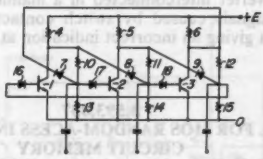
A device for energizing sequentially and at a given time interval plural loads, such as an electric lamps relays, or a solenoids and deenergizing simultaneously all loads, at a lapse of a certain time after the final load has been energized, does not use any mechanical switching elements. The device comprises an electric circuit consisting of plural stages connected in parallel to a source of electric potential and each including a load and an SCR connected in series. Each stage includes a pair of series-connected variable resistors connected between the cathode of the SCR of one stage and the gate of the SCR of the next succeeding stage, and a condenser connected between the source and the junction point between the pair of series-connected variable resistors.

3,593,034

ELECTRICAL RING COUNTER CIRCUIT

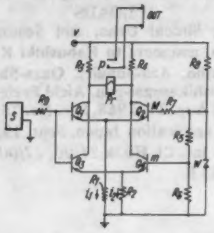
Hachiro Omote, Osaka, Japan, assignor to Matsushita Electrical Industrial Co., Ltd., Kadoma-shi, Osaka, Japan

Filed Dec. 24, 1968, Ser. No. 786,636
Int. Cl. H03k *21/00, 23/08, 3/26*
U.S. Cl. 307—223 **4 Claims**



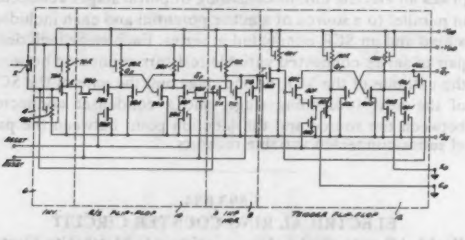
A tristable circuit of which the main components are three transistors and three diodes, wherein the conduction of the transistors is switched by applying a trigger pulse thereto so that when one of the transistors is rendered conductive, the other two transistors are rendered nonconductive.

3,593,035
MARGINAL SWITCHING ARRANGEMENT
Jean Victor Martens, Deurne-Zuid, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Nov. 18, 1968, Ser. No. 776,473
Claims priority, application Belgium, Dec. 29, 1967, Pat. No. 708,711
Int. Cl. H03k 5/20
U.S. Cl. 307—235 7 Claims



The arrangement provides two long-tail transistor pairs with paralleled collector outputs and a detecting device branched across the above pair of outputs. The input signal is compared with the upper and lower levels of the selected range by means of the first and a second transistor pair and gives rise to equal potentials at both ends of the detecting device except when this input signal is above or below the range.

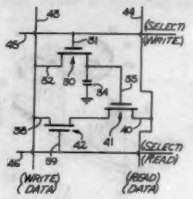
3,593,036
MOSFET MOMENTARY SWITCH CIRCUIT
Stephen P. F. Ma, Santa Monica, and Richard E. Sklar, Los Angeles, both of, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Dec. 15, 1969, Ser. No. 885,132
Int. Cl. H03k 17/16
U.S. Cl. 307—247 5 Claims



A metal oxide semiconductor field effect transistor (MOSFET) circuit of a type that can be constructed on a single semiconductor substrate which accepts a signal from a manually operated momentary switch and provides a DC output signal at one of two possible voltage levels. The circuit includes a trigger flip-flop which provides the DC output signal. The circuit also includes a NOR gate, an RS flip-flop and an inverter interconnected in a manner to prevent the spurious signals caused by switch contact bounce or line noise from giving an incorrect indication at the output of the circuit.

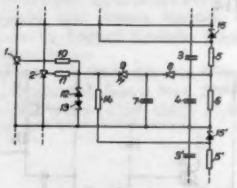
3,593,037
CELL FOR MOS RANDOM-ACESS INTEGRATED CIRCUIT MEMORY
Marcian E. Hoff, Jr., Mountain view,, Calif., assignor to Intel Corporation, Mountain View, Calif.
Filed Mar. 13, 1970, Ser. No. 19,322
Int. Cl. G11c 11/34
U.S. Cl. 307—238 12 Claims

A cell readily adaptable for use in a random-access integrated circuit memory which utilizes metal-oxide-semiconductors (MOS) devices is disclosed. The cell is a dynamic storage device which utilizes the parasitic capacitance associated with the lead and gate of an MOS device for storage. The cell is adaptable for use in a memory which has a



separate select-write line, select-read line, write data line and read data line, and is not particularly sensitive to the signal level on these lines as are previous cells.

3,593,038
FIRING CIRCUIT FOR SERIES-CONNECTED CONTROLLED SEMI-CONDUCTOR RECTIFIERS
Nils Hylten-Cavallius; Carl Ingvar Boksjo, and Sven Erland Lindblad, all of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Aug. 15, 1966, Ser. No. 572,250
Claims priority, application Sweden, Aug. 13, 1965, 10581/65
Int. Cl. H03k 17/00
U.S. Cl. 307—252 L 4 Claims

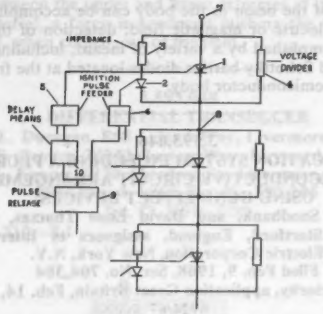


A chain of series-connected semiconductor rectifiers has a voltage divider connected in parallel therewith. A firing circuit is connected on the one hand to the control electrode and to one of the main electrodes of each rectifier and on the other hand to two different points on the voltage divider. The firing circuit derives a control voltage between such points, which is fed to the rectifier by a switching means, such as an optically controlled semiconductor.

3,593,039
CIRCUIT ARRANGEMENT FOR REDUCING ELECTRIC STRAINS IN THYRISTOR TYPE STATIC CURRENT CONVERTERS
Carl Ingvar Boksjo, Ludvika, and Per Gustav Johannes Svedberg, Vallingby, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Nov. 16, 1967, Ser. No. 683,521
Claims priority, application Sweden, Nov. 16, 1966, 15,688
Int. Cl. H03k 17/00
U.S. Cl. 307—252 7 Claims

In a high tension thyristor current converter comprising a plurality of similarly designed sections in series with each other, each section including at least one main thyristor, a voltage divider and a control device, each such section is shunted by an auxiliary thyristor circuit dimensioned in such a way that the electric strains at the time of switching on and off the thyristors are reduced. In this case it is possible to delay the ignition or the main thyristor with respect to the ignition of the auxiliary thyristor, until the voltage across the main thyristor has declined to a value not endangering the ig-

nition of said thyristor, and/or to delay the extinction of the auxiliary thyristor relative to the extinction of the main



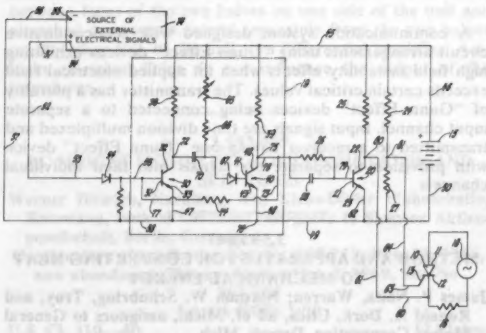
thyristor, so that the recovery time of the main thyristor will be determined by said auxiliary thyristor.

3,593,040

FAST RISE ELECTRIC TRIGGER PULSE CIRCUIT

Donald E. Graham, Bellbrook, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1969, Ser. No. 879,700
Int. Cl. H03k *17/00, 3/26*
U.S. Cl. 307—252 5 Claims



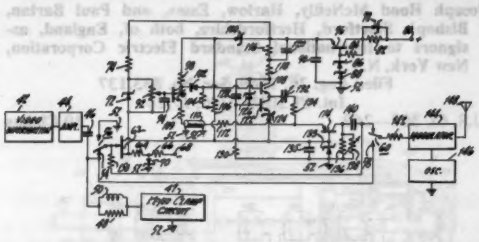
A fast rise electric trigger pulse circuit for producing a fast rise electric pulse for triggering a silicon controlled rectifier into an electrical load. The gate and cathode electrodes of the silicon controlled rectifier are connected to the positive polarity terminal of a source of direct current potential through separate, parallel resistors and the cathode electrode is also connected to the negative polarity terminal of the source of direct current potential through the collector-emitter electrodes of a normally not-conducting transistor. An externally generated electrical signal triggers a monostable multivibrator circuit to the alternate state which produces an electrical control signal of a substantially constant magnitude for a predetermined duration. The control signal is applied across the base-emitter electrodes of the transistor through a coupling circuit which reduces the magnitude of the control signal across the base-emitter electrodes over a predetermined time interval in the polarity relationship which will initiate collector-emitter current flow through the transistor to connect the gate-cathode electrodes of the silicon control rectifier across the source of direct current potential.

3,593,041

DIFFERENTIAL PHASE DISTORTION COMPENSATOR FOR COLOR TELEVISION EQUIPMENT

Pierre Labaree, St. Bruno, Canada, assignor to RCA Corporation

Filed Sept. 27, 1968, Ser. No. 763,151
Int. Cl. H03b *3/04*
U.S. Cl. 307—262 8 Claims



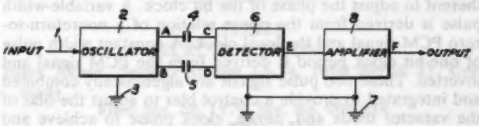
A circuit to compensate for differential phase distortion in color television equipment, that is, to compensate for the undesired phase shift of the color subcarrier information in television equipment due to variation in amplitude of the luminance signal.

3,593,042

R. F. COUPLED LINE RECEIVER WITH D. C. ISOLATION

Charles R. Cook, Jr., North Palm Beach, Fla., assignor to International Telephone and Telegraph Corporation

Filed Sept. 23, 1968, Ser. No. 761,407
Int. Cl. H03k *5/00*
U.S. Cl. 307—261 9 Claims



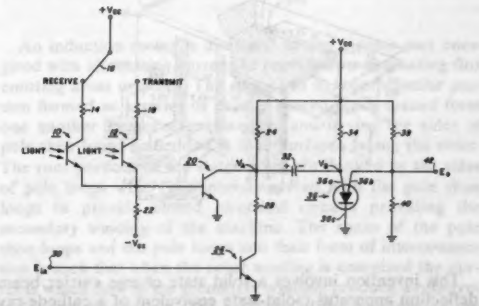
This is an electric circuit for receiving and converting a digital signal to a sinusoidal RF signal in one section of the circuit. This converted signal is then coupled to a second section of the circuit which is DC electrically isolated from the first section wherein said signal is then converted to its original form. Since each circuit section has a separate DC ground reference, the noise immunity of the overall circuit is improved.

3,593,043

PULSE SHAPING CIRCUIT

David R. Shuey, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Feb. 3, 1969, Ser. No. 795,787
Int. Cl. H03k *1/18*
U.S. Cl. 307—265 6 Claims



In a facsimile transceiver, apparatus for shaping the drum position output pulses generated by photoreceptors at the

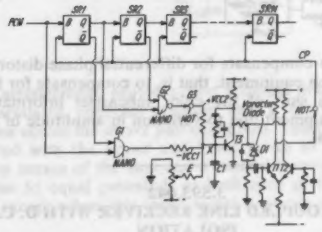
transmitter and receiver. The shaping apparatus provides pulses of precise time duration, the duration being one of two discrete times dependent upon whether the transceiver is in the transmitting or receiving mode.

3,593,044

BIT SYNCHRONIZATION ARRANGEMENT FOR PCM SYSTEMS

Joseph Hood McNeilly, Harlow, Essex, and Paul Barton, Bishop's Stortford, Hertfordshire, both of, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 26, 1969, Ser. No. 853,137
Int. Cl. H03k *5/00, 17/26*
U.S. Cl. 307—269 **10 Claims**



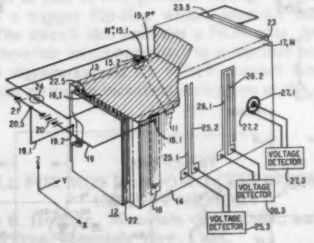
The local bit clock is provided by an astable multivibrator having a varactor diode included in the cross coupling thereof to adjust the phase of the bit clock. A variable-width pulse is derived from the phase relation of a nonreturn-to-zero PCM signal and the local clock. A constant width pulse of one-bit clock period is derived from the PCM signal and inverted. These two pulse signals are algebraically combined and integrated to provide a control bias to adjust the bias of the varactor diode and, hence, clock phase to achieve and maintain bit synchronization.

3,593,045

MULTIADDRESS SWITCH USING A CONFINED ELECTRON BEAM IN A SEMICONDUCTOR

Dirk J. Bartelink, Morris Township, Morris County, and George Persky, North Planfield, both of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 29, 1969, Ser. No. 888,331
Int. Cl. H03k *3/26*
U.S. Cl. 307—299 **18 Claims**



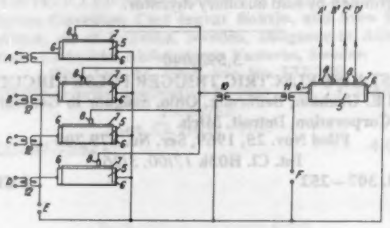
This invention involves a solid state charge carrier beam deflection apparatus (solid-state equivalent of a cathode-ray tube), utilizing a high resistivity semiconductor body for the propagation medium of the beam. A relatively high electric field in the semiconductory body is utilized to propel a beam of electrons or holes in a direction from a rear surface to a front surface of the body, the beam being characterized by a confined cross section throughout the beam's trajectory. Deflection of the beam in the body can be accomplished by transverse electric or magnetic field; detection of the beam can be accomplished by a variety of means, including ohmic contacts and Schottky barrier diodes located at the front surface of the semiconductor body.

3,593,046

COMMUNICATION SYSTEM INCLUDING A PLURALITY OF SEMICONDUCTIVE CIRCUIT ARRANGEMENTS USING GUNN EFFECT DEVICES

Carl Peter Sandbank, and David Lane Thomas, both of Bishop's Stortford, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 9, 1968, Ser. No. 704,384
Claims priority, application Great Britain, Feb. 14, 1967, 6924/67
Int. Cl. H03k *19/08*
U.S. Cl. 307—299 **9 Claims**



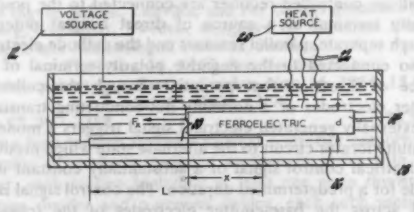
A communication system designed with semiconductive circuit arrangements using "Gunn Effect" devices exhibiting high field instability effects when an applied electrical field exceeds certain critical values. The transmitter has a plurality of "Gunn Effect" devices being connected to a separate input channel. Input signals are time division multiplexed and transmitted to a receiver having one "Gunn Effect" device with provision to separate the signals into their individual channels.

3,593,047

METHOD AND APPARATUS FOR CONVERTING HEAT TO MECHANICAL ENERGY

James P. Nolta, Warren; Norman W. Schubring, Troy, and Ronald A. Dork, Utica, all of, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 16, 1970, Ser. No. 11,556
Int. Cl. H02n *4/00*
U.S. Cl. 310—4 **7 Claims**



A ferroelectric material having its permittivity dependent on temperature is disposed partially in an electric field between a pair of capacitor plates. A heat source is provided to heat the ferroelectric material just outside the capacitor plates to increase the permittivity above that existing

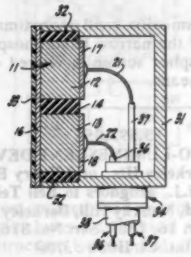
between the capacitor plates so that a force pulls the heated portion into the field. The force is enhanced by providing a liquid of high permittivity between the ferroelectric material and the capacitor plates. By using a liquid having a permittivity between the upper and lower extremes of the ferroelectric material, a force is produced pushing the ferroelectric material, when cooled, out of the field.

3,593,048

DIFFERENTIAL TRANSDUCER

Harold L. Dunegan, 868 Leland Way, Livermore, Calif.; Albert E. Brown, 28242 Beaton Way, Hayward, Calif., and Paul L. Knauss, 1138 Aberdeen St., Livermore, Calif.

Filed Dec. 4, 1969, Ser. No. 882,205
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.1 **5 Claims**



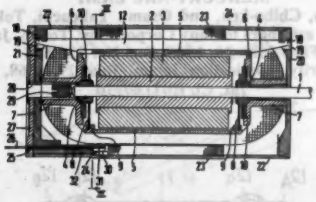
A transducer such as piezoelectric crystal is halved and, with one half inverted, the parts are joined together with insulation therebetween. An electrical connection is made between faces of the two halves on one side of the unit and electrical conductors extend separately from the two halves on the other side of the unit to a differential amplifier. Ambient electrical fields do not influence the output of the transducer.

3,593,049

DC MIDGET MOTOR FREE OF COMMUTATOR AND SLIP RINGS

Werner Dittrich, Nurnberg, and Klaus-Dieter Wahnschaffe, Katzwang, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Continuation of application Ser. No. 597,719, Nov. 29, 1966, now abandoned. This application Oct. 2, 1969, Ser. No. 863,764
Int. Cl. H02k *5/00*
U.S. Cl. 310—40 **12 Claims**



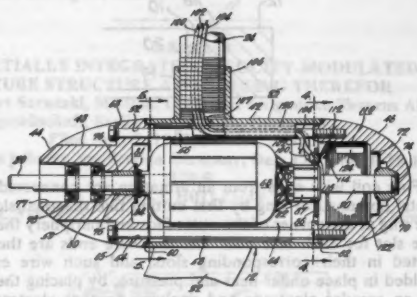
Midget motor free of commutator or sliprings provided with a permanent magnet system secured to the shaft of the motor, a stationary armature winding mounted on a winding frame member, and a magnetic yoke surrounding the latter. The bearings for the rotor shaft adjoin the winding frame member, which is preferably of drum-shaped construction, both bearings being located in respective hub-shaped appendages of the end walls of the winding frame member.

3,593,050

TROLLING MOTOR

James Kittrell Ware, Columbus, Miss., assignor to AMBAC Industries, Incorporated, Columbus, Miss.

Filed Apr. 1, 1969, Ser. No. 812,257
Int. Cl. H02k *5/12*
U.S. Cl. 310—87 **6 Claims**



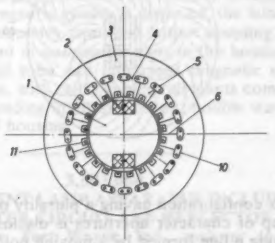
A trolling motor for operation immersed in water is provided including a watertight motor housing, permanent magnet flux generating means supported by the motor housing and an armature assembly having a shaft rotatably supported by the motor housing, the trolling motor being arranged such that heat generated by operation of the motor is conducted through the motor housing directly to the water.

3,593,051

ELECTRIC MOTOR

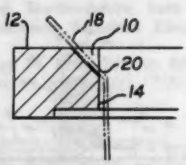
Samy Akbar, Berliner-Strasse 13-14, 1000 Berlin 31, Germany

Filed Jan. 29, 1970, Ser. No. 006,914
Int. Cl. H02k *17/00*
U.S. Cl. 310—166 **13 Claims**



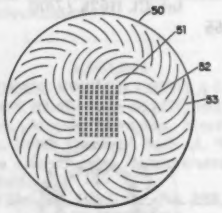
An induction motor is disclosed having a rotor part energized with alternating current to provide two alternating flux emitting areas or poles. The stator has its inner annular portion formed as a series of closely spaced poles spaced form one another by nonmagnetic gaps, and having the sides of pole shoe loops embedded in their surfaces facing the rotor. The root portions of the stator poles are flanked by the sides of pole loops which are interconnected with the pole shoe loops to provide closed electrical circuits providing the secondary winding of the machine. The spans of the pole shoe loops and the pole loops and their form of interconnection is such that when the rotor winding is energized the currents which flow in the secondary winding produce a relatively high starting torque. The positions of the windings on the rotor/stator may be reversed.

3,593,052
DYNAMOELECTRIC MACHINE COMMUTATOR WITH COIL END SLATS AND METHOD OF MAKING SAME
Leslie L. Hoffman, Los Angeles, Calif., assignor to Vernitron Corporation, New York, N.Y.
Filed Aug. 18, 1969, Ser. No. 850,713
Int. Cl. H02k 13/04
U.S. Cl. 310—234 3 Claims



Fine coil wire ends from an armature are connected to a metal commutator ring by first cutting fine diagonal slots in the ring at the corner of the outer face and periphery thereof, one slot for each wire end. The fine wire ends are then inserted in their corresponding slots, and such wire end is welded in place under heat and pressure, by placing the ring on an annular electrode and applying another electrode to the face of the ring sequentially at each slot, while conducting welding current between such electrodes thereby causing the metal adjacent each slot to fuse. Thus, upon removal of electrodes the fused metal cools and solidifies, leaving the fine wire terminals connected to the ring.

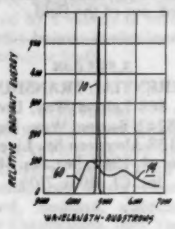
3,593,053
HIGH POWER DISSIPATION MATRIX FOR A CHARACTER DISPLAY TUBE
Johannes Mueller, San Diego, Calif., assignor to Stromberg Datagraphix, Inc., San Diego, Calif.
Filed July 2, 1969, Ser. No. 838,621
Int. Cl. H01j 29/46, 61/52, 31/16
U.S. Cl. 313—86 3 Claims



A matrix configuration having a plurality of slits surrounding a group of character apertures is disclosed. Each slit is located along a line formed by a moving point having both a radial and a circumferential component. Typical slits have an approximately spiral appearance. Such slits have the characteristics of providing sufficient flexibility to accommodate differential thermal expansion in the matrix sheet without warping or distortion while permitting rapid dissipation of the heat from the matrix to the supporting structure.

3,593,054
IMAGE DEVICE HAVING 100 ANGSTROM BANDWIDTH PHOSPHOR EMISSIVE IN BLUE REGION
Simon Larach, Princeton, N.J., assignor to RCA Corporation
Division of Ser. No. 338,191, Jan. 16, 1964, Pat. No. 3,454,716.
This application Feb. 28, 1969, Ser. No. 803,219
Int. Cl. H01j 29/20, 63/06, 31/20
U.S. Cl. 313—92 2 Claims

An image device includes a phosphor screen comprising a first phosphor which has a relatively broad emission band and a relatively low peak emission intensity and a second phosphor which has a relatively narrow emission band and a relatively high peak emission intensity. The narrow emission band of the second phosphor lies within the broad emission band of the first phosphor. In high ambient light, the phosphor screen may be viewed through optical filter means

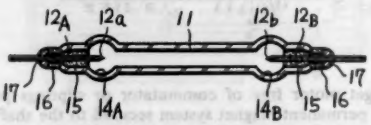


having a narrow transmission band approximately matched to the emission band of the narrow band phosphor. In low ambient light, the phosphor screen is viewed directly without the aid of the filter means.

3,593,055
ELECTRO-LUMINESCENT DEVICE
Joseph E. Geusic, Berkeley Hts., and Henry E. D. Scovil, New Vernon, both of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Apr. 16, 1969, Ser. No. 816,763
Int. Cl. H05b 33/00
U.S. Cl. 313—108 D 9 Claims

Increased light output results from certain design modifications in a GaAs infrared emitting diode coated with a phosphor for converting this emission to visible light. These design modifications include shape and dimensional considerations for minimizing internal reflection and absorption of infrared emission within the diode as well as dimensional and compositional considerations as applied to the coating for reducing scattering losses and minimizing internal reflection of its emission.

3,593,056
MERCURY-ARC LAMP
Jiro Degawa, Chiba-ken, and Osamu Takeuchi, Tokyo, both of, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed June 26, 1969, Ser. No. 836,871
Claims priority, application Japan, June 29, 1968, 43/45376
Int. Cl. H01j 61/30
U.S. Cl. 313—220 3 Claims



A mercury-arc lamp formed of a generally cylindrical-shaped tube with electrodes mounted at either end thereof and comprising a line source of light when illuminated from the central portion of the tube between the electrodes and

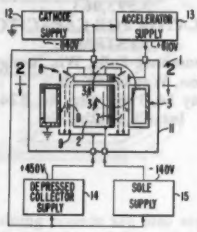
with the tube enlarged adjacent the electrodes so as to reduce devitrification of the tube and provide a long-life mercury-arc lamp.

3,593,057

INJECTED BEAM CROSSED-FIELD AMPLIFIER EMPLOYING RF CONTROL OF THE INJECTED BEAM CURRENT

George Berstein, Millburn, and Hunter L. McDowell, Chatham, both of, N.J.

Filed Aug. 31, 1967, Ser. No. 664,686
Int. Cl. H01j *25/50, 25/58*
U.S. Cl. 315—39.51 4 Claims



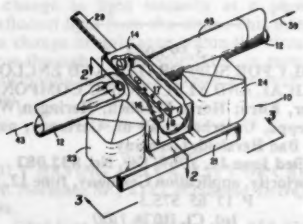
An injected beam crossed-field amplifier is disclosed. The crossed-field tube includes a cylindrical nonemitting cathode sole electrode structure surrounded by a concentrically disposed slow wave anode circuit to define a magnetron-type interaction region in the annular space therebetween. An electron gun assembly is disposed at one end of the magnetron interaction region for injecting a beam of electrons into the magnetron interaction region axially thereof. A beam collector structure is disposed for collecting the electron beam after passage thereof through the magnetron interaction region. Radio frequency wave energy to be amplified is applied to the annular slow wave circuit, such circuit including a circuit sever to prevent reentrance of the wave energy on the circuit and to provide a drift space for debunching of the reentrant electron beam. By passing the electron beam through the magnetron interaction region to a collector structure, the dynamic range of the amplifier is extended down well into the low input signal regime, thereby providing an extremely wide dynamic range for the amplifier.

3,593,058

CROSSED-FIELD ELECTRON INJECTOR FOR AN ELECTRON ACCELERATOR

Harold A. Hogg, Cupertino, Calif.

Filed Mar. 17, 1970, Ser. No. 20,289
Int. Cl. H01j *7/46, 19/80*
U.S. Cl. 315—39 10 Claims



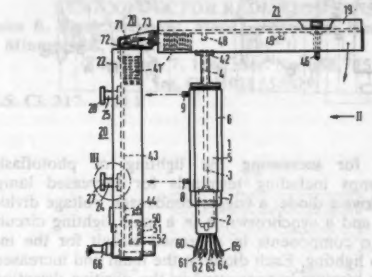
An electron injector wherein a stream of electrons is emitted from a gridded thermionic emitter into a region between two electrodes. An electric field alternating at a microwave frequency is applied between the electrodes, and the electron stream leaves the thermionic emitter parallel to this field. A steady magnetic field is applied across the region in a direction that is transverse to the electric field. The combined effects of the microwave electric field and the steady magnetic field on the electron stream are such that the stream becomes focused into a bunch that follows a quasi-cycloidal orbit in which the electrons strike a secondary emitter from which an amplified bunch of electrons is emitted to follow a similar orbit, to be further focused into a bunch and to strike another secondary emitter. This process is repeated until the desired intensity is achieved whereupon the final bunch of electrons is injected into an electron accelerator during the final orbit.

3,593,059

PARTIALLY INTEGRATED VELOCITY-MODULATED TUBE STRUCTURE AND HOUSING THEREFOR

Herbert Sarnezki, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Nov. 5, 1969, Ser. No. 874,289
Claims priority, application Germany, Dec. 12, 1968, P 18 14 320.9
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 5 Claims



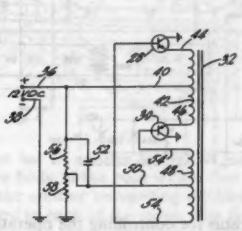
A velocity-modulated tube, particularly a travelling wave tube, having an electron beam generator at one end and an electron collector at the opposite end, which is operatively enclosed, in adjusted relation, in a magnetic system for form an integrated assembly, a ribbed or finned component surrounding said assembly, constructed to dissipate heat, in which the finned component comprises a separable high frequency tight housing in which the velocity-modulated tube and integrated magnetic system is disposed, the latter having flangeless high frequency input and output coupling elements which are received in cooperable slots in the housing operative to retain said tube and integrated magnetic system in operative position, with said coupling elements communicating with corresponding input and output hollow wave guides connected to said housing.

3,593,060

FLUORESCENT LAMP APPARATUS INCLUDING INVERTER CIRCUIT AND REFLECTOR

Roger L. Kryder, Fort Wayne, Ind., assignor to General Manufacturing, Inc., Fort Wayne, Ind.

Filed Apr. 9, 1969, Ser. No. 814,622
Int. Cl. H05b *41/02*
U.S. Cl. 315—219 3 Claims



An electronic inverter circuit particularly suitable for energizing fluorescent lamps from a direct current power supply

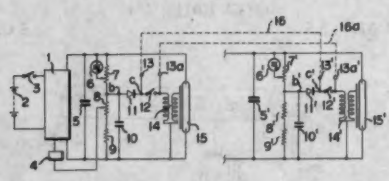
wherein transistors are employed as switches in a self-excited oscillator circuit. The circuitry includes a transformer core alternately saturable at a high frequency under the control of the transistor switches, the transformer including a feedback winding controlling operation of the transistors. A transformer secondary winding supplies a high voltage output to the fluorescent lamp, and the high voltage output includes a conductor disposed adjacent the lamp to reduce the voltage required to initiate an arc therein.

3,593,061

APPARATUS FOR INCREASING THE LIGHTING OF PHOTOFLASH DISCHARGE LAMPS

Kouichi Takahata, and Takeshi Suda, both of Tokyo, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Feb. 20, 1969, Ser. No. 801,019
Claims priority, application Japan, Feb. 23, 1968, 43/13,387
Int. Cl. H05b *37/00, 39/00*
U.S. Cl. 315—241 **3 Claims**



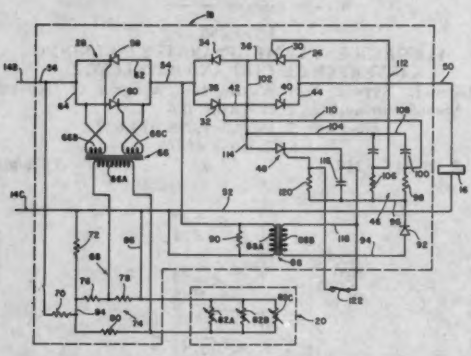
Apparatus for increasing the lighting of photoflash discharge lamps including terminals for increased lamp lighting employs a diode, a trigger condenser, voltage dividing resistors and a synchroswitch in a main lighting circuit and the same components in a second circuit for the increased lamp lighting. Each diode in the main and increased lamp lighting circuits is connected in the positive direction relative to the discharge of its respective trigger condenser between a point connecting the trigger condenser to its voltage dividing resistors and a point connecting one side of the terminal to one side of its respective synchroswitch.

3,593,062

CONTROL APPARATUS RESPONSIVE TO EXCESS CURRENT UTILIZING TEMPERATURE SENSITIVE RESISTORS

Frederic R. Quinn, Red Hook, N.Y., assignor to Zyrotron Industries, Inc., South Hackensack, N.J.

Filed Jan. 13, 1970, Ser. No. 2,569
Int. Cl. H02h *5/04, 3/08*
U.S. Cl. 317—13 **14 Claims**



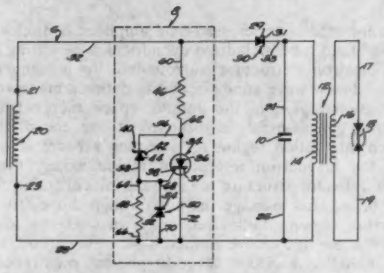
A control apparatus for controlling the operation of an associated device which includes a first switch comprising a pair of silicon controlled rectifiers connected in inverse parallel relationship between a load and a source of power. The silicon controlled rectifiers or SCR's are gated on by a gate signal from a gate signal generator which is connected to the first switch SCR's by a control SCR. Conduction of the control SCR is regulated by a selectively operable device which, therefore, controls the operation of the first switch to connect power to the load. In practice, a second switch is serially connected to the first switch and similarly comprises a pair of SCR's connected in inverse parallel relationship. The conduction of the SCR's comprising the second switch are controlled by a condition responsive device which is operable to cause these SCR's to stop conducting in response to the occurrence of a preselected event. After such event, the selectively operable device must be actuated to close the first switch.

3,593,063

CHARGE REGULATOR FOR CAPACITOR IGNITION SYSTEM

David T. Cavil, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 14, 1969, Ser. No. 824,496
Int. Cl. H02h *3/20*
U.S. Cl. 317—16 **5 Claims**



Disclosed herein is a charge regulator for a storage capacitor in a capacitive discharge ignition system. The charge regulator includes a switching device in the form of a thyristor and a zener diode. The thyristor is in parallel with the storage capacitor and the output terminals of a charging coil. When the charge on the capacitor reaches a predetermined maximum safe value, the thyristor will become conducting and switch a loading resistor into a shunt path across the output terminals of the charging coil to maintain the charge on the capacitor below the predetermined maximum value.

3,593,064

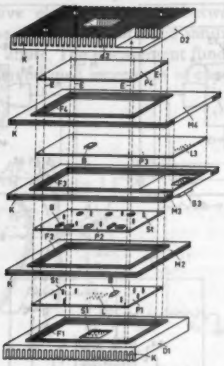
ASSEMBLY FOR SUPPORTING AND ENCLOSING ELECTRICAL AND ELECTRONIC COMPONENTS

Horst Wagner, Eitra; Horst Frohlich, Heringen/Werra, and Rudolf Hoeppe, Unterhaun, all of, Germany, assignors to Zuse K.G., Bad Hersfeld, Germany

Filed June 11, 1969, Ser. No. 832,082
Claims priority, application Germany, June 12, 1968, P 17 65 575.3
Int. Cl. H02b *1/00*
U.S. Cl. 317—100 **15 Claims**

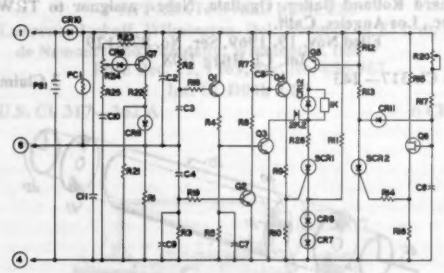
Plug-in insulating boards which carry logical building blocks, conductors or like components are accommodated in sockets of stacked profiled rectangular metallic frames which form part of a composite enclosure for the boards. The frames are provided with external cooling fins and cooperate with each other or with the metallic lids of the enclosure to sealingly engage the marginal portions of the boards. The

fasteners which separably connect the frames and the lids to each other extend at right angles to the plane of the boards.



The plugs of adjoining boards are also separable from each other by moving the boards at right angles to their planes.

3,593,065
SHEET DETECTION APPARATUS
Robert A. Domalski, Rochester; Richard C. Kahler, Onatrio, and Donald J. Quant, Rochester, all of, N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed July 14, 1969, Ser. No. 841,516
Int. Cl. G01n *21/30*
U.S. Cl. 317—124 **2 Claims**



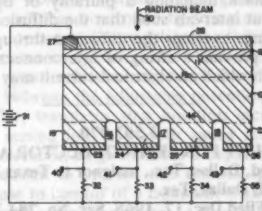
Apparatus which inactivates a xerographic machine in response to a copy sheet misspuff. A sheet of paper remaining on the xerographic drum beyond the stripping station causes a change in light intensity at a photocell which receives reflected light from the drum. This intensity change results in a change in resistance within the circuit to cause a current flow through a capacitor. This, in turn, energizes a threshold switching means to energize a control relay to stop the machine.

3,593,066
ASSEMBLY HAVING A PLURALITY OF CAPACITORS
Rayford M. Norman, Sr., 2117 Windover Drive, N.E., Huntsville, Ala.
Filed Sept. 11, 1969, Ser. No. 857,024
Int. Cl. H01g *1/02*
U.S. Cl. 317—230 **5 Claims**

An electrical capacitor assembly consisting of a base assembly having a plurality of like spaced pairs of electrical receptacles and a plurality of elongated electrolytic capacitor elements each having a pair of pronged terminals being adapted to be plugged into a pair of the receptacles. One receptacle of each pair of terminals is connected to a common external conductor and each of the remaining receptacles is connected to individual external conductors, whereby

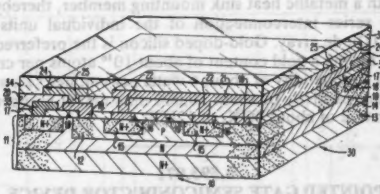
a composite capacitor assembly is made up of a desired selected combination of capacitor elements.

3,593,067
SEMICONDUCTOR RADIATION SENSOR
John B. Flynn, Belmont, Mass., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Aug. 7, 1967, Ser. No. 658,725
Int. Cl. H01l *15/00*
U.S. Cl. 317—234 R **1 Claim**



An integrated diode array for use as a radiation sensor is shown. The individual diodes are isolated by grooves formed on one side of the array and by biasing the array so that the charge depletion layer of the PN junction extends beyond the grooves.

3,593,068
BUS BAR TRANSISTOR AND METHOD OF MAKING SAME
Laurence L. Rosier, Champaign, Ill., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 6, 1967, Ser. No. 688,488
Int. Cl. H01l *5/02, 7/60*
U.S. Cl. 317—234 **32 Claims**



A transistor has its emitter formed as parallel strips in the surface of the body of the base with a first level of electrical contact for the emitter comprising parallel elongated members connected to each of the strips. The first level of electrical contact for the base comprises parallel elongated members extending parallel to each of the emitter elongated members and disposed between the emitter elongated members and on the outer sides of the two outermost emitter

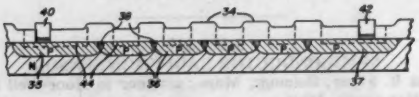
elongated members. The first level of electrical contact for the base also includes a rectangular shaped member, which contacts the ends of all of the base elongated members and the sides of the two outermost base elongated members. An electrical insulating layer is disposed over the first level of contacts and has holes therein to permit each of the emitter elongated members to be connected to a bus bar on a second level. Each of the sides of the rectangular shaped member is connected through holes in the insulating layer to a bus bar that forms a second level base contact.

3,593,069

INTEGRATED CIRCUIT RESISTOR AND METHOD OF MAKING THE SAME

Lee P. Madden, Sunnyvale, Calif., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Oct. 8, 1969, Ser. No. 864,812
Int. Cl. H011 *5/00*
U.S. Cl. 317—234 **5 Claims**



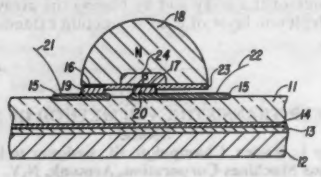
A monolithic integrated circuit diffused resistor and method of making same by diffusing impurities of a first conductivity type into a substrate of a second conductivity type through a mask including a plurality of openings spaced along a line at intervals such that the diffusion through each of the openings overlaps the diffusions through the adjacent openings to provide a string of interconnected diffused regions through which an electrical current may be passed.

3,593,070

SUBMOUNT FOR SEMICONDUCTOR ASSEMBLY

Bruce S. Reed, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 17, 1968, Ser. No. 784,315
Int. Cl. H011 *1/12, 15/00*
U.S. Cl. 317—234 R **3 Claims**



A radiant diode assembly s provided with a thermally conductive, electrically nonconductive submount, in combination with a metallic heat sink mounting member, thereby permitting series interconnection of the individual units of a multipl1Diode array. Gold-doped silicon is the preferred submount, having a gold content of about 10^{16} atoms per $cm.^3$, a thermal conductviity of about 6 watts per cm. per ° k., and an electrical resistivity of about 20,000 ohm-cm. at an operating temperature of about 80°K. to 120°K.

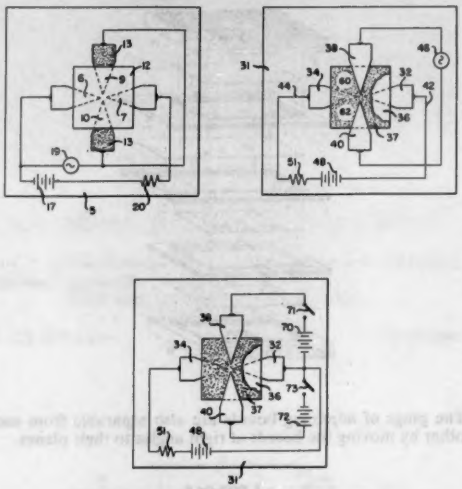
3,593,071

POINTED GATE SEMICONDUCTOR DEVICE

John L. Janning, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Apr. 4, 1969, Ser. No. 813,633
Int. Cl. H011 *11/14*
U.S. Cl. 317—235 R **11 Claims**

The present invention relates to a field effect semiconductor device which has a pointed source electrode pointing toward a pointed drain electrode. A pointed gate electrode is placed to each side of said pointed source and drain electrodes, in insulative contact with semiconductor material, which lies between the pointed source electrode and the pointed drain electrode. A control potential is applied between the pointed gate electrodes and the pointed source



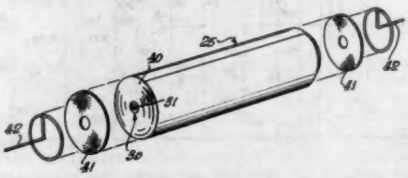
electrode, the control potential being thus concentrated within the semiconductor material. The field effect semiconductor device of the present invention has good transconductance.

3,593,072

METALLIZED CAPACITOR

Richard Rolland Bailey, Ogallala, Nebr., assignor to TRW, Inc., Los Angeles, Calif.

Filed Nov. 19, 1969, Ser. No. 878,129
Int. Cl. H01g *1/08*
U.S. Cl. 317—243 **3 Claims**



A capacitor utilizing metallized dielectric layers. A surface of a dielectric layer is coated with a metal film. A plurality of layer of the metallized dielectric are stratified whereby the metallized surface of a dielectric layer is in substantial abutment with the metallized surface of another dielectric layer, the metallized surface not contacting a nonmetallized surface. An offset in the stratification establishes two electrodes. After convolutely winding the plurality of stratified, metallized dielectric layers, electrical contact is made to the two electrodes.

3,593,073

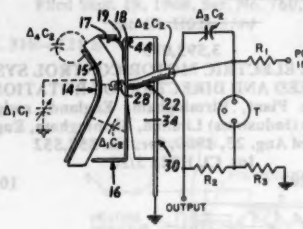
ANTENNA SYSTEM FOR CAPACITANCE RESPONSIVE CIRCUIT

Carl E. Atkins, Montclair, N.J., assignor to Wagner Electric Corporation

Continuation-in-part of application Ser. No. 674,833, Oct. 12, 1967. This application Dec. 16, 1968, Ser. No. 786,819
Int. Cl. H01g *1/06*
U.S. Cl. 317—256 **11 Claims**

Each of two embodiments of an antenna system for capacitance-controlled circuits comprises an antenna

member which forms a common plate of first and second capacitances, and a shield for interrupting electric flux between the antenna and grounded elements near the rear surface of the antenna. A first embodiment also comprises a fixed increment of the first capacitance between the antenna and a conductive element situated between the antenna system encasement and the controlled sanitary facility which the encasement abuts. The encasement functions as a dielectric in the aforementioned increment of capacitance, and the



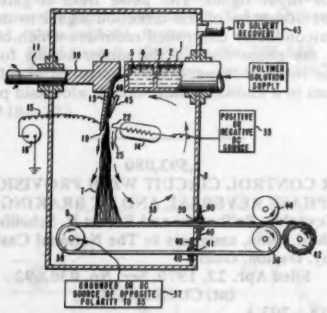
conductive element operates to prevent spurious increases in antenna capacitance to ground which result from the intermittent flow of water in the controlled sanitary facility. A second embodiment comprises a conductive element disposed about the periphery of he antenna member and spaced therefrom This conductive element forms a second plate to the second capacitance, and effectively shields he antenna member from electric fields apssing through the c encasement.

3,593,074

APPARATUS AND PROCESS

Lawrence Isakoff, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1969, Ser. No. 886,967
Int. Cl. D04h *5/00*
U.S. Cl. 317—262 A **6 Claims**


TO SOLVENT RECOVERY
POLYMER SOLUTION SUPPLY
POSITIVE OR NEGATIVE DC SOURCE
GROUNDED OR DC SOURCE OF OPPOSITE POLARITY TO DC

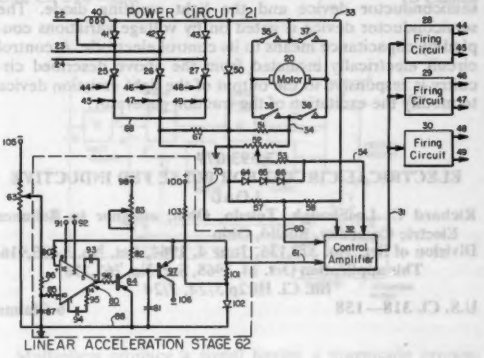
A process for preparing fibrous sheets of organic synthetic polymers in which a filamentary web is entrained in a gaseous stream flowing in a path toward a receiving surface and the web is electrostatically charged before being collected, the improvement being confining the gaseous flow before charging by directing it through a critically dimensioned passage which converges in the direction of flow. The apparatus includes an element which together with the target plate of the charging device for electrostatically charging the fibers structurally defines the passage.

3,593,075

MOTOR CONTROL SYSTEM WITH LINEAR ACCELERATION CIRCUIT

Thomas Pantelakis, Margate, and Dudley D. Nye, Jr., Fort Lauderdale, both of, Fla., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 30, 1969, Ser. No. 837,456
Int. Cl. H02p *1/04*
U.S. Cl. 318—391 **8 Claims**



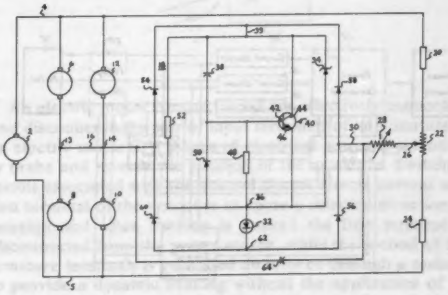
A DC motor control system is energized over power semiconductor switches controlled by firing circuits. A control amplifier is connected to regulate the firing circuits and thus regulate motor energization. An adjustable potentiometer provides a speed reference signal. A linear acceleration stage, coupled between the adjustable potentiometer and the control amplifier, translates step function increases of the potentiometer setting into a smooth speed increase signal. The linear acceleration stage includes a capacitor connected in a charging circuit to provide this smooth speed increase signal in response to turnoff of a transistor which, when conducting, disables the charging circuit. An operational amplifier is connected to turn off the transistor and allow the capacitor to charge when the speed control potentiometer is adjusted to signal a speed increase. Responsive to a speed decrease, the transistor is immediately gated on to discharge the capacitor and subsequently assist the system in preventing motor coast-down below the new speed setting.

3,593,076

WHEEL SLIP CONTROL ARRANGEMENT

Lloyd W. McSparran, Erie, and Russell M. Smith, North East, both of, Pa., assignors to General Electric Company

Filed Feb. 2, 1970, Ser. No. 7,786
Int. Cl. B61c *15/12*
U.S. Cl. 318—52 **16 Claims**



A wheel slip control arrangement for traction vehicles wherein a pair of DC series field traction motors are con-

nected in series by a common junction. A plurality of such pairs are preferably connected in parallel across the output of the traction generator with their common junctions being interconnected. A voltage responsive circuit and current responsive actuating device, such as a light emission device, are connected in a circuit between the common junction and the output of a voltage reference circuit whereby the device is actuated by a time derivative of the voltage difference between the common junction and the output of the reference circuit. The disclosed circuit includes a bridge rectifier whose output is connected in series circuit with a semiconductor device and the light emitting diode. The semiconductor device is gated on by voltage variations coupled by capacitance means to its control electrode. A control circuit electrically insulated from the above described circuitry is responsive to the output of the light emission device to modify the excitation of the traction generator.

3,593,077

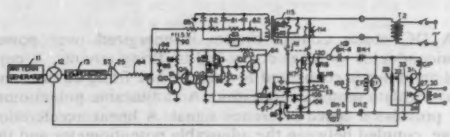
ELECTRICAL CIRCUIT FOR PULSE FED INDUCTIVE LOAD

Richard C. Loshbough, Toledo, Ohio, assignor to Reliance Electric Company, Euclid, Ohio

Division of Ser. No. 373,136, June 4, 1964, Pat. No. 3,435,916. This application Oct. 14, 1968, Ser. No. 767,276

Int. Cl. H02p *5/24, 7/24*

U.S. Cl. 318—158 **6 Claims**



A circuit for applying current pulsations of opposed polarity to an inductive load wherein the net current in the load is the difference in the magnitude of the pulsations. A capacitance is connected across the inductive load to permit the buildup of a net current. Circulating currents in the capacitance can be restricted by inductance or resistance in series between the source of pulsations and the capacitance.

3,593,078

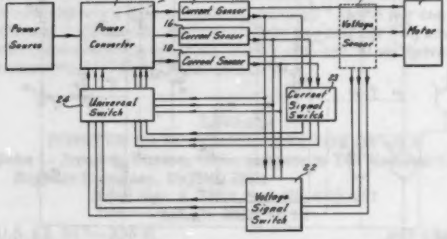
STARTING AND OPERATING CONTROL FOR AN AC MOTOR POWERED BY A DC POWER SUPPLY

Ernest H. Domshy, Downey, and Victor Moller, Sierra Madra, both of, Calif., assignors to North American Rockwell Corporation

Filed Sept. 8, 1969, Ser. No. 855,998

Int. Cl. H02p *1/46*

U.S. Cl. 318—180 **7 Claims**



An AC Motor Control, wherein the AC motor is powered by a DC power supply through a DC to AC converter circuit, and wherein the control has an AC current sensor for producing a current signal indicative of the current supplied to the motor which signal is coupled to the converter to prevent excessive current drain on the power supply under starting condition and an AC voltage sensor for producing a voltage signal indicative of the potential across the motor leads and this voltage signal is used to control the converter under operating conditions so that synchronous speed is maintained. Since, under operating condition, the current is inherently substantially stable at rated current, a switch is incorporated responsive to the current signal at rated current to decouple the current signal from the converter and couple the voltage signal thereto.

3,593,079

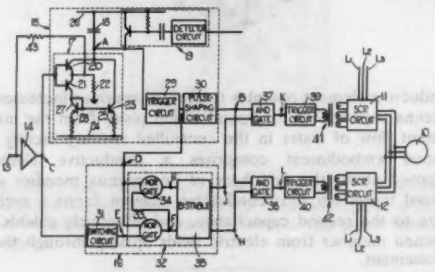
POLYPHASE ELECTRIC MOTOR CONTROL SYSTEM FOR SPEED AND DIRECTION OF ROTATION

Anthony Brian Plant, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Aug. 25, 1969, Ser. No. 852,552

Int. Cl. H02p *3/20*

U.S. Cl. 318—202 **10 Claims**



The invention relates to a system for controlling the speed and direction of rotation of a polyphase AC motor in accordance with the magnitude and polarity respectively of an input signal. The input signal is fed to a firing circuit which is also controlled by the voltage in one of the phase lines of the motor supply. The firing circuit produces a train of square pulses of constant width and whose phase relationship with the voltages in the motor supply phase lines is dependent on the magnitude only of the input signal. The input signal is also fed to a direction sensing circuit which produces a direction signal in one of two lines depending on the polarity only of the input signal. The pulse train is gated by the presence or otherwise of the direction signal to one of two sets of semiconductor controlled rectifiers which control the current in the phase lines of the motor supply for forward and reverse rotation respectively. The speed of this rotation is dependent in a known manner on the aforesaid phase relationship.

3,593,080

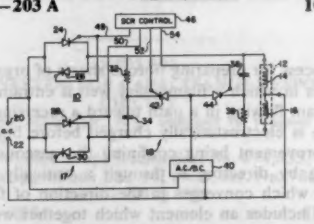
MOTOR CONTROL CIRCUIT WITH PROVISION FOR PHASE REVERSAL AND DC BRAKING

Jack H. Reynolds, Bellbrook, and Ernest R. Schelling, Kettering, both of, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Apr. 22, 1970, Ser. No. 030,692

Int. Cl. H02p *1/40*

U.S. Cl. 318—203 A **10 Claims**



A motor control circuit is described by which an induction stepping motor can be controlled to rotate either clockwise

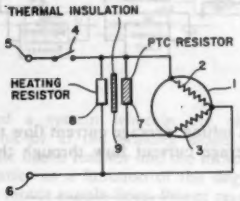
or counterclockwise, or to cease rotating. The control circuit uses silicon-controlled rectifiers to accomplish the necessary switching and includes a network which has the double function of a phase-shifting network and a silicon control rectifier commutating network.

3,593,081

STARTING DEVICE WITH A PTC-RESISTOR FOR A SINGLE PHASE MOTOR

Sven Forst, Costa Mesa, Calif., assignor to Danfoss A/S, Nordborg, Denmark

Filed Sept. 19, 1968, Ser. No. 760,780
Int. Cl. H02p *1/44*
U.S. Cl. 318—221 E **3 Claims**



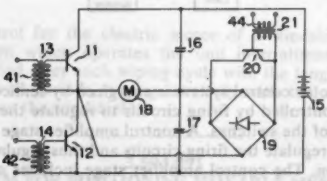
This invention relates to a single phase motor which includes in the circuit means thereof a starting winding in series with a PTC-resistor having lower and upper resistance ranges. The PTC resistor is designed so that it is only operable in the low resistance range when heated solely by the effects of the starting current flowing therethrough. External heating means is provided for supplying an amount of auxiliary heat to the PTC-resistor to effect a shift to the high resistance range. The external heating means supplies heat at a rate which causes the shift to the higher resistance range to occur at a predetermined time.

3,593,082

AC MOTOR DRIVING MEANS

Susumu Tadakuma, and Yasuaki Miyazaki, both of Yokohama-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 9, 1968, Ser. No. 758,553
Claims priority, application Japan, Sept. 30, 1967, 42/62746
Int. Cl. H02p *5/38*
U.S. Cl. 318—227 **6 Claims**



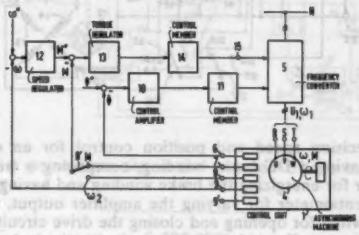
AC motor driving means comprising a DC source, an inverter converting said DC to AC, a semiconductor switch element connected in parallel to the motor connected to the output terminal of the inverter which serves to short the motor terminals, and a control means to allow only a 120° period output to be issued by the inverter per semicycle.

3,593,083

APPARATUS FOR PROVIDING THE PILOT VALUES OF CHARACTERISTICS OF AN ASYNCHRONOUS THREE PHASE MACHINE

Felix Blaschke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Apr. 17, 1969, Ser. No. 816,959
Claims priority, application Switzerland, Apr. 18, 1968, 5765/68;5766/68
Int. Cl. H02p *5/40*
U.S. Cl. 318—195 **13 Claims**



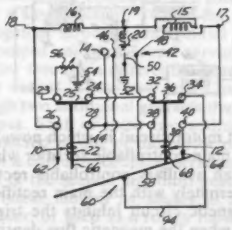
Multipliers produce a signal having a magnitude proportional to the sum of the squares of the rotary flux vectors and the induced three phase voltage vector of an asynchronous three phase machine by first producing signals having instantaneous magnitudes proportional to flux components of voltages induced in two winding axes spaced from each other by 120°. The multipliers multiply each signal magnitude by itself as well as by the other. The resultant products are then algebraically added.

3,593,084

ELECTRIC MOTOR CONTROL CIRCUIT AND SWITCHING MEANS

Thomas B. Dalton, Muskegon, Mich., assignor to Westran Corporation,, Muskegon, Mich.

Filed Jan. 12, 1970, Ser. No. 002,259
Int. Cl. H02p *1/22*
U.S. Cl. 318—261 **7 Claims**

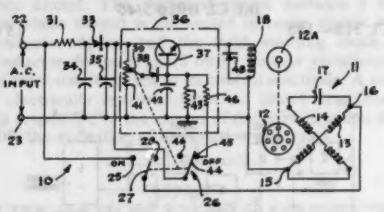


An electric motor control circuit for selectively connecting and disconnecting a pair of input terminals of an armature of an electric motor to a source of electrical power to selectively brake and reverse the rotation of the armature. Switching means associated with the control circuit directs current to a first terminal of the armature to cause a selected direction of rotation and when braking is desired the first terminal is disconnected from the power source, while the second of the armature terminals is grounded directly or through a resistor to provide a dynamic braking without the application of an external voltage being applied across the pair of terminals of the armature. The switching means is so arranged that neither terminal of the armature can be prematurely grounded during the braking or reversing operations.

3,593,085
SPEED AND POSITION CONTROL FOR ELECTRIC MOTOR

Ernest J. Decker, Jr., Carpentersville, Ill., assignor to Jerry K. Kelley, Rosmont, Cook County, Ill.

Filed Dec. 18, 1969, Ser. No. 886,066
Int. Cl. H02p 7/04
U.S. Cl. 318—302 5 Claims

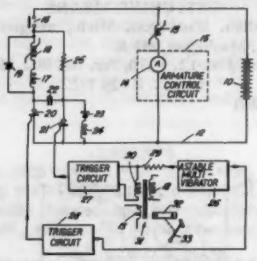


A precision speed and position control for an electric motor having a DC brake winding, comprising a transistor amplifier for energizing the brake winding and having a control potentiometer for varying the amplifier output, and an on-off switch for opening and closing the drive circuit of the motor; the on-off switch is mechanically interlocked with the potentiometer to afford maximum brake excitation whenever the switch is off.

3,593,086
DIRECT CURRENT MOTOR CIRCUITS

Duncan Ulick Thombs, Basingstoke, England, assignor to Lansing Bagnall Limited, Basingstoke, England

Filed Feb. 19, 1970, Ser. No. 12,757
Claims priority, application Great Britain, Feb. 28, 1969, 10898/69
Int. Cl. H02p 5/16, 7/10
U.S. Cl. 318—308 6 Claims



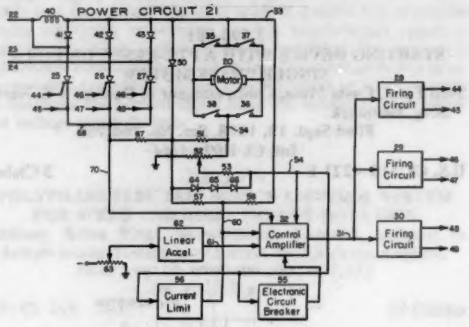
A direct current motor circuit in which power in the motor is controlled by a main controllable rectifier whose condition is terminated by an auxiliary controllable rectifier fed with trigger signals alternately with the main rectifier. A winding coupled to a magnetic circuit inhibits the triggering of the auxiliary rectifier when the magnetic flux density in the magnetic circuit is high. The actual flux density is a balance between a flux produced by the field current of the motor, an opposing flux from an adjustable magnet and a flux produced by the armature current of the motor.

3,593,087
MOTOR CONTROL SYSTEM WITH DOUBLE IR COMPENSATION

Thomas Pantelakis, Margate, and Dudley D. Nye, Jr., Fort Lauderdale, both of, Fla., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 30, 1969, Ser. No. 837,457
Int. Cl. H02p 5/16
U.S. Cl. 318—345 8 Claims

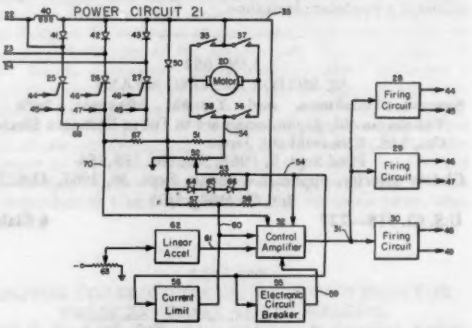
A DC motor control system is energized by semiconductor switches controlled by firing circuits. A control amplifier is connected to regulate the firing circuits and to energize the motor as a function of the armature terminal voltage, motor speed control setting, average current flow through the armature, and average current flow through the semiconductor switches.



3,593,088
MOTOR CONTROL SYSTEM WITH CONTROL AMPLIFIER STAGE HAVING ANTIUNDERSHOOT CIRCUIT

Thomas Pantelakis, Margate, and Dudley D. Nye, Jr., Fort Lauderdale, both of, Fla., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed July 3, 1969, Ser. No. 838,978
Int. Cl. H02p 5/16
U.S. Cl. 318—345 7 Claims



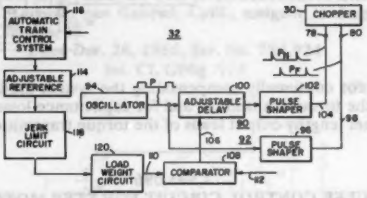
A DC motor control system is energized by semiconductor switches controlled by firing circuits to regulate the conduction times of the switches. A control amplifier stage provides a signal to regulate the firing circuits and thus regulate motor energization. The control amplifier stage includes an operational amplifier (op amp), and a feedback capacitor. A bias voltage is applied in the output circuit to run the op amp near its saturation point at the minimum speed point, or minimum conduction time of the semiconductor switches. As a speed increase is signalled the op amp conduction level decreases. With this arrangement, with a speed reduction signal to reduce conduction of the semiconductor switches, only negligible excess charge appears across the feedback capacitor to minimize undershoot as the motor comes to the new, lower speed.

3,593,089

SYSTEM FOR BLENDING DYNAMIC AND REGENERATIVE BRAKING

Hendrik C. Appelo, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1969, Ser. No. 879,343
Int. Cl. H02p 3/14
U.S. Cl. 318—370 12 Claims



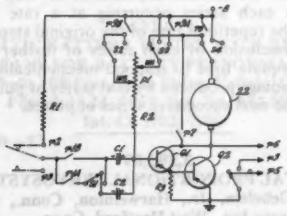
A method and a system wherein the electric power generated by a motor in the braking mode is distributed between a dynamic brake resistor and the motor supply lines in a ratio that varies as a function of the degree of power receptivity of the motor supply lines. Power receptivity is the capability of the supply lines to accept the power generated by the motor in the braking mode at a given time.

3,593,090

INTERMITTENT WINDSHIELD WIPER CONTROL

Robert W. Kearns, Detroit, Mich., assignor to Tann Company, Detroit, Mich.

Division of Ser. No. 523,433, Mar. 7, 1966, Pat. No. 3,483,459.
Filed Apr. 16, 1969, Ser. No. 816,748
Int. Cl. H02p 1/04
U.S. Cl. 318—444 18 Claims



A control for the electric motor of a windshield wiper motor unit which operates the unit intermittently with a dwell period after each wiping cycle with the length of time of the dwell periods varying inversely with the amount of moisture on the windshield.

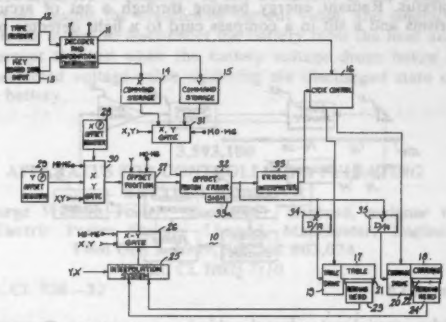
3,593,091

SYSTEM FOR POSITIONING MOVABLE MEMBERS WITH ABSOLUTE DIMENSION WITH SELECTABLE OFFSET POINT

Geoffrey A. Ross, Canton Center, Conn., assignor to Pratt & Whitney Inc., West Hartford, Conn.

Filed Apr. 24, 1969, Ser. No. 818,878
Int. Cl. G05b 11/18
U.S. Cl. 318—572 10 Claims

A positioning system in which the actual position of a controlled member is always expressed in absolute dimension with respect to a fixed reference point and its position with respect to a second selectable reference or offset point is determined by subtracting the absolute value of the second reference point from the actual position of the controlled member.

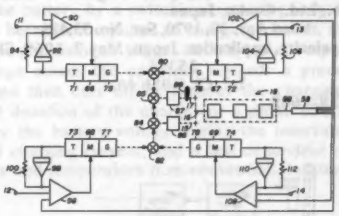


3,593,092

MULTIPLE OUTPUT MULTIPLEX ACTUATOR

Robert V. Flippo, Dallas, Tex., assignor to LTV Electrosystems, Inc., Dallas, Tex.

Filed Feb. 2, 1970, Ser. No. 7,674
Int. Cl. G05b 9/02
U.S. Cl. 318—564 11 Claims



Four servomotors are coupled together in a velocity-summing arrangement to produce two output motions. These two output motions are combined in a linkage arrangement that results in a single output. Two of the four servomotors are coupled together through a differential gearset that has a single rotary output and the second servomotor pair is also coupled together through a differential gearset that produces a single rotary output. These two rotary outputs are in turn coupled through two additional gearsets that each have a single rotary output. Each of these two additional gearsets has one input connected to one of the motor pair outputs and a second input in a common coupling arrangement. The rotary output of each of the second and third gearsets may be converted into a linear motion by means of a rotary-to-linear motion transducer, or used as a rotary motion. Operation of one of the rotary-to-linear motion transducers is restrained below a preestablished force level. Each of the four servomotors is controlled individually by a separate generated control signal in a system that includes a tachometer for generating velocity feedback signals and a linear voltage differential transformer for generating position feedback signals.

3,593,093

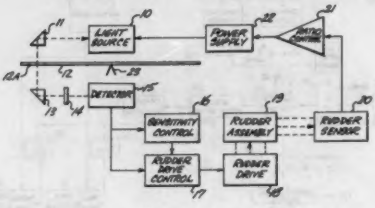
MARINE AUTOPILOT SYSTEM

Bruce H. Bettcher, Bellevue, Wash., assignor to Energy Control Corporation, Bellvue, Wash.

Filed May 21, 1969, Ser. No. 826,592
Int. Cl. G05d 1/00; B64c 13/18
U.S. Cl. 318—588 12 Claims

This application discloses a novel low-cost autopilot assembly for ships. The system includes a simplified control loop between the rudder and the course-determining ap-

paratus with the signal paths between the course-determining apparatus and the rudder used for course corrections being maintained separate from the signal path used for conveying rudder position information to the course-determining apparatus. Radiant energy passing through a set of arcuate prisms and a slit in a compass card to a light detector provides error signals when the ship is not on course. Corrective action then takes place in response to such signals. A rudder position-sensing device controls the energization of the light source so that as the ship is brought to an on-course condition the intensity of the light source is adjusted. Details of the electrical system as well as mechanical details of one preferred embodiment are provided.

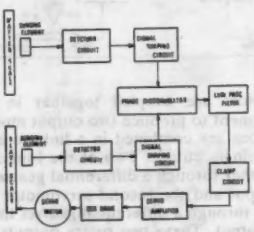


3,593,094

AUTOMATIC LEVEL ADJUSTING MEANS FOR SUSTAINING THE CROSSRAIL USED IN DOUBLE HOUSING TYPE MACHINE TOOLS IN ITS ACCURATE HORIZONTAL POSITION

Takao Katsumaru, Sakai, Japan, assignor to Shin Nippon Koki Co., Ltd., Osaka, Japan

Filed Apr. 30, 1970, Ser. No. 33,426
Claims priority, application Japan, May 7, 1969, SH0 44/35354
Int. Cl. G05b *1/01*
U.S. Cl. 318—608 **3 Claims**



In a large-sized double housing type machine tool, an automatic level adjusting means for sustaining the crossrail in its accurate horizontal position is provided; said means comprises a pair of electrosensing elements for detecting the crossrail losing its horizontal balance in the course of shift or swivel of the toolhead mounted on said crossrail, adjustment signal transfer circuit connected to said electrosensing elements, a servomotor means adapted to be driven when receiving said adjustment signal, and compensating gear means coupled with said servomotor means.

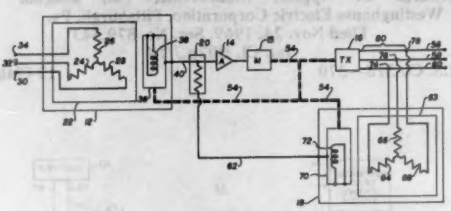
3,593,095

SYSTEM TO COMPENSATE FOR THE NONLINEARITY OF A SELF-SYNCHRONOUS TORQUE TRANSMITTER

Sidney Davis, East Norwich, N.Y., assignor to Vernitron Corporation, New York, N.Y.

Filed Dec. 26, 1968, Ser. No. 786,905
Int. Cl. G05b *11/12*; G05d *23/275*
U.S. Cl. 318—692 **2 Claims**

The invention is concerned with a conventional servosystem which in response to an input electrical signal produces a torque output via a mechanical feedback shaft which drives a synchro torque transmitter. A feedback transducer responsive to the electrical output signal of the torque transmitter and to its torque input (actually the torque output of the servomechanism) produces an electrical feedback signal for continually compensating the system for inaccuracy in the torque transmitter and for capacitance losses resulting from lengthy output leads of the torque transmitter.

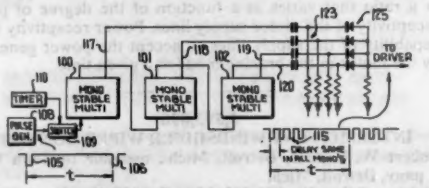


3,593,096

PULSE CONTROL CIRCUIT FOR STEP MOTORS

Harold R. Newell, South Newbury, N.H., assignor to Mesur-Matic Electronics Corporation, Warner, N.H.

Filed Aug. 15, 1969, Ser. No. 850,545
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 **6 Claims**



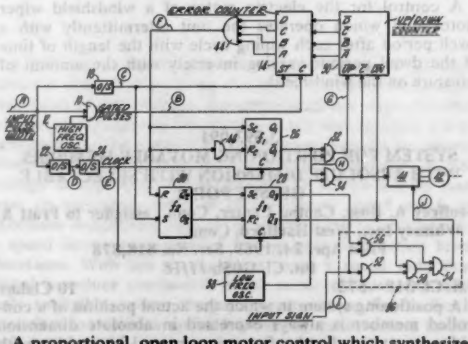
A control circuit for supplying pulses to sequentially excite the windings of a multiple phase step motor includes a generator for supplying stepping pulses at a preselected repetition rate. In response to each of these stepping pulses, a further portion of the control circuit produces a series of further pulses, each series containing an identical number of pulses, less than the number of phases of the step motor, and the pulses in each series occurring at a rate sufficiently greater than the repetition rate of the original stepping pulses that at the conclusion of each series of further pulses the motor has adequate time to respond mechanically to the excitation of windings produced by that series of pulses prior to initiation of the next successive series of pulses.

3,593,097

DIGITAL PROPORTIONAL SERVOSYSTEM

Edward F. Gebelein, Jr., Harweinton, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed June 24, 1969, Ser. No. 836,122
Int. Cl. G05b *19/40*
U.S. Cl. 318—696 **17 Claims**



A proportional, open loop motor control which synthesizes a pulse count proportional to the width of pulse width modu-

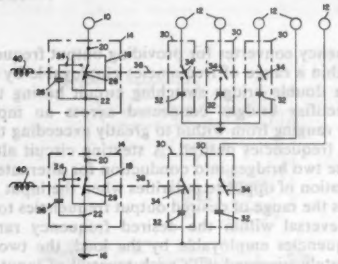
lated command signals, the thus synthesized pulse count being compared to the accumulation of previously synthesized counts sent to a step motor or other type of incremental actuator to determine existence and direction of a position error, an indication of error being employed to gate proportional pulses from a low frequency oscillator to said motor to be controlled.

3,593,098

SPECTROMETER INTEGRATOR SYSTEM FOR PROVIDING OVERLAPPING INTEGRATION PERIODS

Veijo V. Varnela, San Gabriel, Calif., assignor to Angstrom, Inc., Chicago, Ill.

Filed Dec. 26, 1968, Ser. No. 786,924
Int. Cl. G06g 7/18
U.S. Cl. 320—1 **10 Claims**



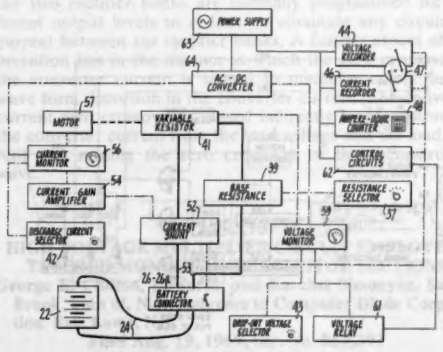
Spectrometer photocurrent integrator apparatus for analyzing different component groups of a radiation spectrum over different, overlapping integration periods utilizing the dual component ratio technique and a common reference component. The apparatus includes a plurality of integrators coupled to a reference component transducer in such manner that the current integrated by any one of the integrators is unaffected by the occurrence of contemporaneous integrations by any one or more of the other integrators.

3,593,099

AUTOMATIC BATTERY TESTER WITH RECORDING MEANS FOR BATTERY PERFORMANCE

Hans K. Scholl, 108 Franciscan Drive, Vallejo, Calif.

Filed July 24, 1969, Ser. No. 844,500
Int. Cl. H02j 7/00
U.S. Cl. 320—13 **2 Claims**



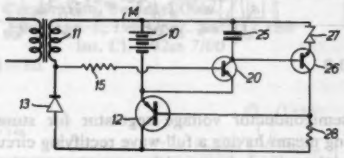
An automatic battery discharger and tester for recording the performance of a battery being discharged under a selected resistance load wherein the battery's current and voltage are continuously monitored and compared against preselected current and voltage values, and includes means for maintaining a constant discharge current by varying the load resistance in response to any deviations of the battery current against the preselected current value, and similarly includes means to disconnect the battery from the load and interrupt the test when the battery voltage drops below a preselected voltage value signifying the discharged state of the battery.

3,593,100

APPARATUS FOR CONTROLLING A PULSATING BATTERY CHARGER

George William Foster, Manchester, England, assignor to Electric Power Storage Limited, Manchester, England

Filed Oct. 2, 1969, Ser. No. 863,074
Int. Cl. H02j 7/10
U.S. Cl. 320—22 **8 Claims**



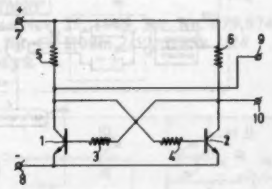
An automatic battery charging circuit employing rectified alternating current includes a capacitor which is connected across the battery by a switching transistor only during the intervals between the pulses of charging current, and a level responsive transistor or trigger circuit, which responds when the voltage across the capacitor exceeds a predetermined value, and then cuts off or reduces the charging current. Thus the duration of the charge (or a phase of it) is determined by the battery voltage during the intervals between pulses of charging current, and is less dependent on battery resistance and temperature than conventional systems.

3,593,101

ARRANGEMENT FOR CONNECTING AN ELECTRIC BATTERY TO A SOURCE OF CHARGING CURRENT

Derk Jan Chris Wassink, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 5, 1968, Ser. No. 757,572
Claims priority, application Netherlands, Sept. 8, 1967, 6712329
Int. Cl. H01m 45/04; H02j 7/00
U.S. Cl. 320—25 **9 Claims**



A switching device for interconnecting an electric battery with a DC source of charge current includes a bistable trigger circuit having input terminals connected to the current source and output terminals for connection to a battery to be charged. The trigger circuit is controlled by the battery polarity so that it always assumes the proper state for charging the battery for either of the two possible battery connections.

3,593,102

SEMICONDUCTOR VOLTAGE REGULATOR

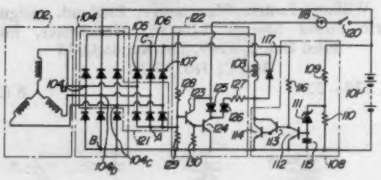
Yoshichi Kawashima, Gifu-shi, and Hisami Mitsueda, Mie-gun, Mie-ken, both of, Japan, assignors to Nippon Denso Company Limited, Kariya-shi, Japan

Filed May 8, 1969, Ser. No. 822,952

Claims priority, application Japan, May 16, 1968, May 21, 1968, 43/33081;43/34199

Int. Cl. H02j 7/18

U.S. Cl. 320—64 10 Claims



A semiconductor voltage regulator for storage battery charging means having a full-wave rectifying circuit, wherein the regulator includes an AC generator rotation detecting element connected to the half-wave rectifying ends of the full-wave rectifying circuit, a field current control transistor circuit, and an auxiliary full-wave rectifying circuit for controlling through another control circuit the flashing of a charge indication lamp and the initial exciting current of a field winding.

3,593,103

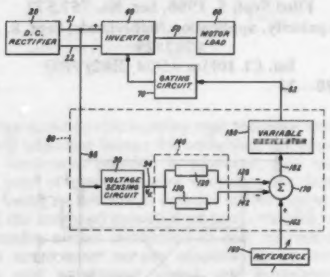
INVERTER SYSTEM WITH AUTOMATIC RIDETHROUGH

Edgar F. Chandler, Media, Pa., and Arthur M. Roberts, Cherry Hill, N.J., assignors to General Electric Company

Filed Mar. 4, 1969, Ser. No. 804,203

Int. Cl. H02m 5/44

U.S. Cl. 321—2 12 Claims



For enabling a variable frequency electric power inverter to ride through a temporary loss or reduction of input power, means is provided for sensing an excursion of DC bus voltage beyond a predetermined normal magnitude range and for deriving first and second signals respectively proportional to the magnitude of the excursion and to its integral, and the frequency of the inverter is varied according to the difference between a given signal and the sum of said first and second signals.

3,593,104

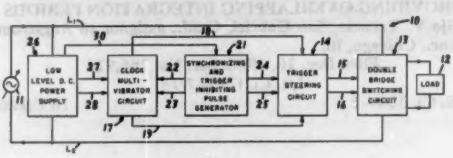
FREQUENCY CONVERTER PROVIDING EMPLOYABLE OUTPUT FREQUENCIES

William W. Fisher, Woodstock, and John W. Pike, Endwell, both of, N.Y., assignors to Rotron Incorporated, Woodstock, N.Y.

Filed June 26, 1969, Ser. No. 836,758

Int. Cl. H02m 5/40

U.S. Cl. 321—4 11 Claims



A frequency converter for providing output frequencies to a load within a range of frequencies employable by the load includes a double bridge switching circuit having two controlled rectifier bridges connected across an input of a frequency ranging from within to greatly exceeding the range of output frequencies desired. A steering circuit alternately triggers the two bridges into conduction for alternate periods of rectification of opposite polarities when the input frequency exceeds the range of desired output frequencies to provide polarity reversal within the desired frequency range. For input frequencies employable by the load, the two bridges are alternately triggered with each reversal of input polarity thereby applying the input, substantially unaltered, to the load. Timing of the alternate triggering of the two bridges is provided by an astable multivibrator having a natural frequency lower than any frequency within the desired range of output frequencies and a pulse generator supplies output pulses in synchronization with the crossover points of the input to override the natural frequency of the multivibrator. Pulses produced by the pulse generator additionally are employed to inhibit triggering of the controlled rectifier bridges during input crossover to allow extinguishing of the component controlled rectifiers and these pulses are derived from a rectified unsmoothed DC signal of a low level DC power supply which provides DC bias potential for the multivibrator, pulse generator and steering circuit.

3,593,105

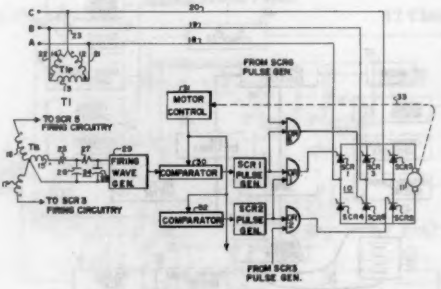
PHASE SEQUENCE INSENSITIVE FIRING CIRCUIT

Paul D. Grohaugh, New Berlin, Wis., assignor to The Louis Allis Company

Filed Sept. 3, 1969, Ser. No. 854,881

Int. Cl. H02m 1/08; H02p 5/06

U.S. Cl. 321—5 8 Claims



A firing circuit for a phase controlled rectifier system employs the line to line phase voltage to be conducted by a pair of the thyristors of the phase controlled rectifier to develop the firing wave for controlling the firing of the thyristors. The

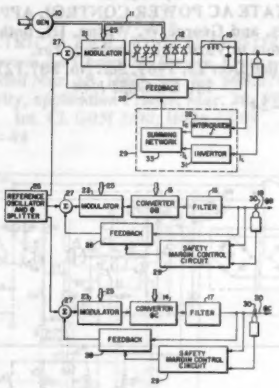
line to line phase voltage is phase shifted a constant amount to produce the appropriate firing wave regardless of the phase sequence or order of connection of the source to the phase controlled rectifier system. Coupling, as by an OR gate, between firing pulse generators for thyristors of a pair, insures that whichever of the two is controlled to fire first because of the sequence of the phases of the source, the firing pulse is also applied to the other thyristor of the pair to cause it to fire.

3,593,106

CYCLOCONVERTER WITH RECTIFIER BANK CONTROL FOR SMOOTH SWITCHING BETWEEN RECTIFIER BANKS

David Logan Lafuze, Waynesboro, Va., assignor to General Electric Company

Filed Mar. 11, 1970, Ser. No. 18,540
Int. Cl. H02m *5/30*
U.S. Cl. 321—7 **14 Claims**



The invention relates to a cycloconverter of the type utilizing phase controlled rectifier banks for generating a constant output frequency signal from a variable frequency input signal. Switchover from the positive to the negative phase controlled rectifier banks is controlled to minimize distortion of the output signal, while yet at the same time, protecting the system against circulating currents between the rectifier banks. The zero crossover point of the converter output current is sensed and utilized to change the programmed output level of the rectifier banks so that there is smooth transition from one bank to the other even though the output levels of the two rectifier banks are normally programmed for different output levels to reduce or eliminate any circulating current between the rectifier banks. A further aspect of this invention lies in the manner in which the zero crossover of the converter current is sensed to minimize errors due to wave form distortion in the converter current. The converter current zero crossover is sensed indirectly by reconstructing the converter current from the load voltage and the load current and sensing the zero crossover of the reconstructed wave.

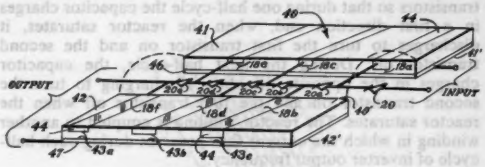
3,593,107

HIGH VOLTAGE MULTIPLIER CIRCUIT EMPLOYING TAPERED MONOLITHIC CAPACITOR SECTIONS

George E. Chilton, Haworth, and Karabet Simonyan, Saddle Brook, both of, N.J., assignors to Computer Diode Corporation, Fair Lawn, N.J.

Filed Aug. 19, 1969, Ser. No. 851,391
Int. Cl. H02m *7/00*
U.S. Cl. 321—8 R **12 Claims**

A high voltage multiplier circuit employing an integrated assembly of diode junctions and a pair of multiple capacitor sections. Each capacitor section is formed from a single block of dielectric, and the individual capacitors are arranged with dielectric portions of varying thickness, the



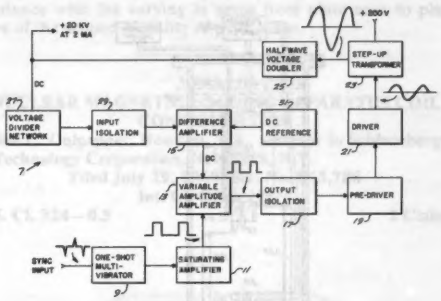
thickness being increased to accommodate the higher voltages applied to successive cascaded sections.

3,593,108

AUTOMATICALLY REGULATED DIRECT CURRENT GENERATING SYSTEM

Michael E. Halleck, Boulder, Colo., assignor to Ball Brothers Research Corporation, Boulder, Colo.

Filed Apr. 1, 1969, Ser. No. 812,188
Int. Cl. H02m *7/00*
U.S. Cl. 321—18 **8 Claims**



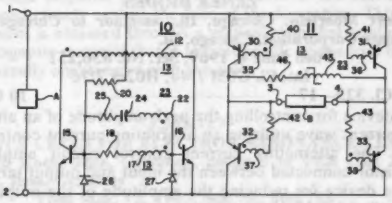
An automatically regulated direct current generating system wherein the amplitude of a square wave signal is controlled by an error voltage derived from a direct current output signal produced by coupling the amplitude controlled square wave signal through an isolation stage and drivers to a transformer where a sine wave is produced and the output rectified. The direct current signal is a high voltage, high current signal suitable for use in providing DC voltages to a cathode-ray tube in a TV system.

3,593,109

TRANSISTOR INVERTER WITH SATURABLE WINDING AND SERIES CAPACITOR FOR FORCED SWITCHING

Armistead L. Wellford, Raleigh, N.C., assignor to General Electric Company

Filed Nov. 25, 1969, Ser. No. 879,874
Int. Cl. H02m *7/52*; **H03k** *3/28*
U.S. Cl. 321—45 R **5 Claims**



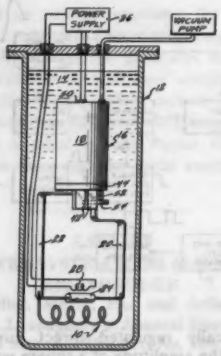
A transistor inverter circuit is provided having a current drive arrangement in which first and second transistors are

alternately rendered conductive to switch main transistors in the inverter circuit. A winding of a saturable reactor and a capacitor are connected in series between the bases of the transistors so that during one half-cycle the capacitor charges in a first direction and, when the reactor saturates, it discharges to turn the first transistor on and the second transistor off. During the next half-cycle, the capacitor charges in the opposite direction, discharging to turn the second transistor on and the first transistor off when the reactor saturates. The reactor winding is coupled to another winding in which the current flow reverses during each half-cycle of inverter output frequency.

3,593,110
DIRECT-CURRENT GENERATOR FOR SUPERCONDUCTING CIRCUITS

Rudolf P. Huebener, Downers Grove, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 17, 1969, Ser. No. 858,828
Claims priority, application Germany, Oct. 18, 1968, P 18 03 804.5
Int. Cl. H02n *11/00*
U.S. Cl. 322—2 **16 Claims**



A DC generator for a superconducting circuit includes a thermoelectric material member with superconductors connected across the member and the superconducting circuit. A heater attached to one end of the thermoelectric member creates a potential gradient along the member while the member is subject to an environmental temperature which maintains the superconductors in a superconducting state.

ERRATUM

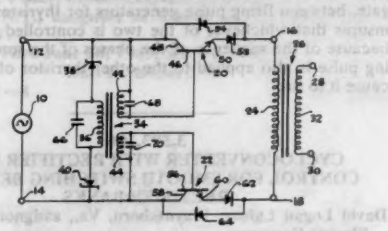
For Class 322—73 see:
Patent No. 3,593,121

3,593,111
VOLTAGE REGULATING DEVICE UTILIZING SERIES TRANSISTORS CONTROLLED BY MEANS INCLUDING ZENER DIODES

Herbert Moerlein, Chicago, Ill., assignor to Chicago Condenser Corporation, Chicago, Ill.

Filed June 4, 1969, Ser. No. 830,251
Int. Cl. G05f *1/44*; H02m *7/20*
U.S. Cl. 323—17 **10 Claims**

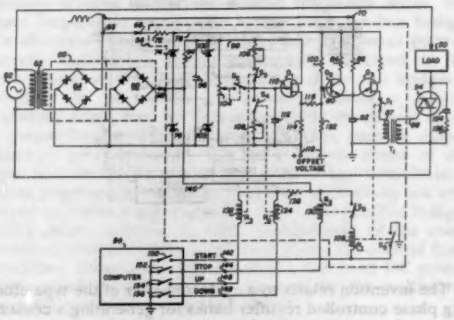
A device for controlling the peak amplitude of an alternating current wave utilizing an alternating current control circuit. The alternating current control circuit employs a transistor connected between the input and output terminals of the device for reducing the amplitude of the output to a controlled level in response to a control signal impressed on the transistor. The control signal is generated by a zener diode having a breakdown potential at the controlled level connected in series with the primary of a control transformer across the input terminals, the output of the transformer being connected across the transistor to oppose the alternating current input impressed thereon. Duplicate circuits are used between corresponding input and output terminals of the device.



3,593,112
SOLID-STATE AC POWER CONTROL APPARATUS

John C. Coats, and George W. Wilson, III, both of Garland, Tex., assignors to Varo, Inc., Garland, Tex.

Filed Dec. 22, 1969, Ser. No. 887,127
Int. Cl. G05f *1/44*
U.S. Cl. 323—24 **10 Claims**



A solid-state AC power control circuit intended for use with digital computers and which can increase or decrease, and turn on or turn off the AC power supplied to a work load in response to the application of computer generated electrical signals to the proper input terminal. The amount of power change is determined by certain characteristics of the signals and the RC time constant of a memory circuit in the device. In addition to input terminals for receiving power increase and decrease input signals, two other input terminals are provided for allowing the controlled power to be turned full off or back on to a preset level by the computer without disturbing the memory circuit.

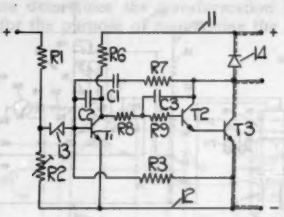
3,593,113
VOLTAGE REGULATORS USING PLANAR TRANSISTORS WITH RADIO INTERFERENCE SUPPRESSION

David Wiley, Walsall, England, assignor to Joseph Lucas Industries Limited, Birmingham, England

Filed July 24, 1969, Ser. No. 844,291
Claims priority, application Great Britain, Aug. 1, 1968, 36718/68
Int. Cl. H02p *9/30*; H02k *11/00*
U.S. Cl. 322—28 **1 Claim**

A voltage regulator for a battery charging system has a first transistor which when conductive permits current to flow in a field winding of a generator used to charge the battery. A second transistor has its collector-emitter path connected in a circuit across the base emitter path of the first transistor so that conduction of the second transistor removes base cur-

rent from the first transistor. The second transistor is controlled by voltage sensitive means in its base circuit and the collector of the second transistor is connected to the base of



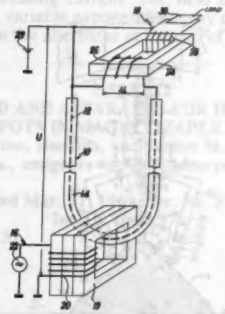
the first transistor through a pair of resistors in series, the junction of the resistors being connected through a capacitor to the collector of the first transistor to minimize radio interference.

3,593,114

ELECTRICAL ISOLATING TRANSFORMER

Alexandre Pierson, Le Chalet 38, Biviers, France

Filed Mar. 18, 1969, Ser. No. 808,079
Claims priority, application France, Mar. 20, 1968, 144633
Int. Cl. G05f *3/00*; H02p *13/04*
U.S. Cl. 323—44 **8 Claims**



An isolating transformer is described for transmitting AC electrical power from a power-supply circuit at ground potential to a load circuit which is at DC high voltage; the transformer comprises a single transfer loop equipped with insulation which withstands the DC voltage, which loop is inductively coupled to a first of said electrical circuits by way of a magnetic circuit completely surrounding the said turn, and inductively coupled to the other of said electrical circuits and at DC potential thereof.

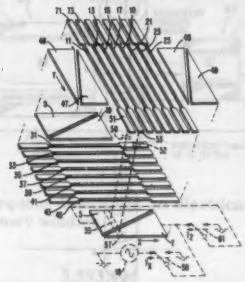
3,593,115

CAPACITIVE VOLTAGE DIVIDER

Herbert Dym, and Robert V. Mazza, both of Mahopac, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of application Ser. No. 837,820, June 30, 1969, now abandoned. This application Sept. 10, 1969, Ser. No. 856,745
Int. Cl. H01g *7/00*; G08c *19/10, 21/00*
U.S. Cl. 323—93 **34 Claims**

A capacitive voltage divider arrangement for driving a position transducer. Individual ones of a first plurality of individual capacitor plates are respectively capacitively coupled to individual ones of a second like plurality of capacitance plate areas, the second plurality of capacitive areas being conductively connected together and varying in area from plate area to plate area. Individual ones of a third plurality of capacitance plate areas, which are conductively connected together, are likewise respectively capacitively coupled to individual ones of the first plurality of plates. The voltage distribution on a plurality of position sensing grid



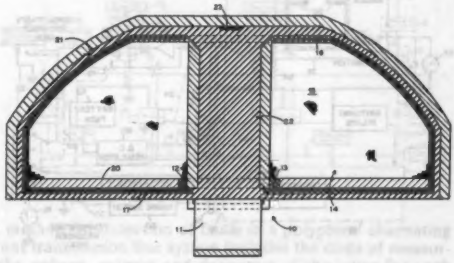
lines, individual ones of which are connected to respective individual ones of the first plurality of plates, varies in accordance with the varying in areas from plate area to plate area of the second plurality of plate areas.

3,593,116

NUCLEAR MAGNETIC LOGGING APPARATUS COIL CONFIGURATION

Willie C. Culpepper, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed July 29, 1969, Ser. No. 845,786
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 **2 Claims**



An illustrative embodiment of the invention selectively shortens the relaxation time of the signal from precessing protons observed with a nuclear magnetic logging tool. The region affected is located immediately adjacent to the formation side of the polarizing-receiving coil, thereby reducing the adverse response resulting from failure of the coil to be positioned closely against the face of the formation. This improvement is obtained through a vertical strip that contains a ferromagnetic material that is located inside of the tool housing generally coextensive with the coils.

3,593,117

SAMPLE CELLS FOR ELECTRON-RESONANCE TESTS

Gerhard Koch, Jena, Germany, assignor to VEB Carl Zeiss Jena, Jena, Germany

Filed Mar. 12, 1969, Ser. No. 806,788
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 **1 Claim**

A sample cell for the reception of highly polar samples to be tested for EPR comprises two parts which are so fitted

together as to form a tube of rectangular cross section inside

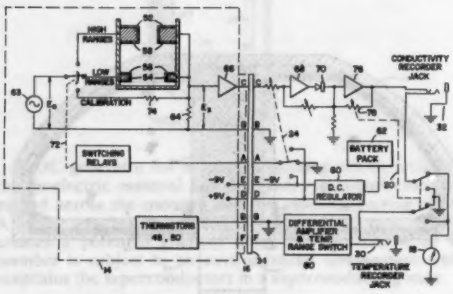
and annular cross section outside. The cell is easy to disassemble for cleaning.

3,593,118

APPARATUS FOR MEASURING THE ELECTRICAL CONDUCTIVITY OF LIQUIDS HAVING DIELECTRIC-FACED ELECTRODES

Nathan H. Chaney, Fountain Valley, and Jerry L. Dillion, Morro Del Mar, both of, Calif., assignors to Montedoro Corporation, San Luis Obispo, Calif.

Filed Sept. 30, 1968, Ser. No. 763,597
Int. Cl. G01n 27/42
U.S. Cl. 324—30 R **4 Claims**



A conductivity meter for measuring the conductivity of liquids can be made to give a reliable, direct conductivity reading on a linear scale by impressing an AC signal across a sample of the liquid between a pair of dielectric-faced, liquid-proofed electrodes, which together with the liquid form a lossy capacitor, and then proceed to measure the loss by an AC ohmmeter or servoed bridge circuit. A linear conductance scale on the ohmmeter is obtained by making the loss the major impedance in the circuit.

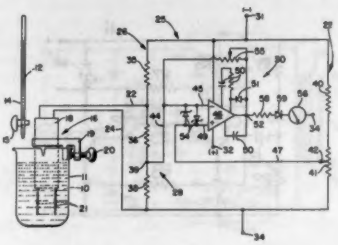
3,593,119

ELECTRONIC TITRIMETER

Thomas W. Brum, North Madison, and Frank E. Cochran, Menton, both of, Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed May 28, 1969, Ser. No. 828,596
Int. Cl. G01n 27/42
U.S. Cl. 324—30 R **3 Claims**

Apparatus for electronically standardizing titration techniques by evaluating end point conditions utilizing a high gain, normalized, conductivity sensor comprising a pair of platinum electrodes immersed in the solution being titrated for affecting current conditions in a sensing circuit, the characteristics of the circuit being monitored by a variable



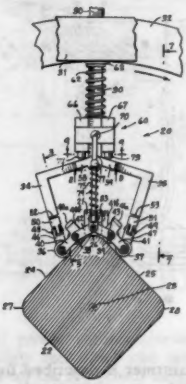
gain integrated circuit operational amplifier and DC meter indicating combination.

3,593,120

APPARATUS MOVABLE RELATIVE TO AN ARTICLE FOR CARRYING A TESTING PROBE AT THE SURFACE OF THE ARTICLE

Joseph M. Mandula, Jr., Seven Hills, and Jack C. Irving, Mentor, both of, Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed June 3, 1969, Ser. No. 829,872
Int. Cl. G01v 33/00
U.S. Cl. 324—34 R **26 Claims**



A carrier for a testing probe, e.g. for eddy current testing, comprising a yoke having a pair of arms flexibly connected at one end and spanned between their other ends by a chain of rolling members supporting the probe so that by means, e.g. spring loaded, which engages the yoke at its flexible connection, the rolling chain can travel on the surface of an article, and over corners or curves, holding the probe in testing contiguity. Supplemental spring-biased means cooperate in guiding the probe, with articulated structure in the carrier to accommodate other surface irregularity, and means are indicated whereby relative rotation is effected between the article and the carrier about an axis through the article, and likewise relative axial displacement, so that the probe may scan the surface of a billet, cylinder or other article along a helical path.

3,593,121

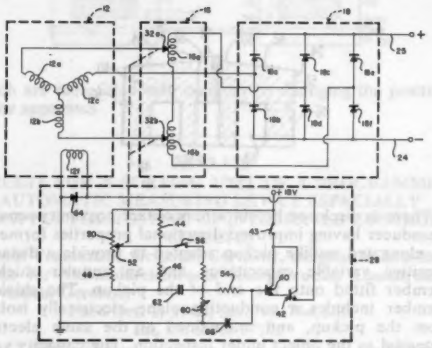
POWER SUPPLY ALTERNATOR HAVING FIELD CURRENT CONTROL AND A VARIABLE TRANSFORMER CONNECTED ACROSS THE OUTPUT

William A. Jones, 45 Lyman Road, Brookline, Mass.

Filed Apr. 30, 1969, Ser. No. 820,445
Int. Cl. H02p 9/30
U.S. Cl. 322—73 **6 Claims**

A power supply for use with a tungsten inert gas or plasma-type arc-welding machine comprises an alternator, a variable

transformer connected to the alternator output, and control means for adjusting the field strength of the alternator to regulate the current output to the welding apparatus. The control means determines the transformation ratio of the transformer for the purpose of maintaining the open circuit



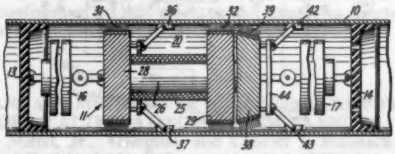
voltage at the transformer output terminals at a preselected level which will provide optimum arc striking regardless of the selected welding current. The field control means may also include a variable exponential decay circuit to adjust the current flow in the alternator at the end of a welding cycle.

3,593,122

METHOD AND APPARATUS FOR IDENTIFYING HARDSPOTS IN MAGNETIZABLE MATERIAL

Robert D. Barton, Houston, and Fenton M. Wood, Sugarland, both of, Tex., assignors to AMF Incorporated, New York, N.Y.

Filed Mar. 27, 1969, Ser. No. 810,953
Int. Cl. G01r *33/12*
U.S. Cl. 324—37 **13 Claims**



Hardspots are detected in a steel pipeline by noting the unique relationship existing between the relative magnitudes of the flux leakage detection signals caused by different types of anomalies, the compared signals, being produced by separately inspecting the pipeline with an active magnetic flux field and with a residual magnetic flux field.

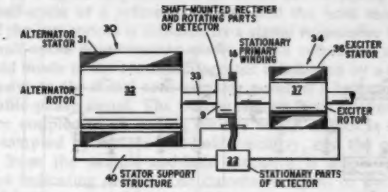
3,593,123

DYNAMO ELECTRIC MACHINES INCLUDING ROTOR WINDING EARTH FAULT DETECTOR

Alan Charles Williamson, and Leonard George Wardle, both of Stafford, England, assignors to The English Electric Company Limited, London, England

Filed Mar. 17, 1969, Ser. No. 807,550
Claims priority, application Great Britain, Mar. 15, 1968, 12636/68
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 **4 Claims**

A dynamo electric machine having a rotor with a field winding energized by a rotatable rectifier network is provided with a transformer the secondary winding of which rotates with the rotor and the primary winding is stationary. In conjunction with ancillary apparatus this enables a flow of fault current between the rotor winding and rotor body to be



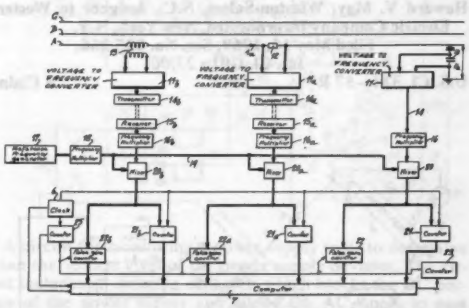
detected by consequent changes in an electrical quantity at the stationary primary winding.

3,593,124

METHOD AND DEVICE FOR DETECTING AND LOCALIZING PHASE-TO-PHASE AND PHASE-TO-EARTH FAULTS WHICH OCCUR IN A SECTION OF A POLYPHASE ALTERNATING CURRENT LINE

Gilbert Moise Cahen, Paris; Henri Georges Guyard, Paris, and Michel Henry Pierre Souillard, Fontenay-aux-Roses, all of, France, assignors to Compagnie Des Compteurs

Filed June 3, 1968, Ser. No. 734,027
Claims priority, application France, June 1, 1967, Mar. 20, 1968, 108,704;144,506
Int. Cl. G01r *31/08*
U.S. Cl. 324—52 **16 Claims**



A method for detection of faults in a polyphase alternating current transmission line system includes the steps of measuring the voltage, current and derivative of the latter for each phase, formulating the equations for the relationship between the measured values of different phases in accordance with Ohm's law, transforming these equations into forms having straight line characteristics by application of numerical coefficients, and repeating the foregoing steps at regular intervals to obtain successive straight lines which intersect in a single point and the coordinates of which characterize the operation of the system thus to show line operation in either a normal manner or the existence of a phase-to-phase or phase-to-earth fault. The related apparatus for carrying out the method includes various instruments for measuring the voltage, current and derivative of the current at regular intervals, instruments for recording the data and a computer for processing the data thus obtained.

3,593,125

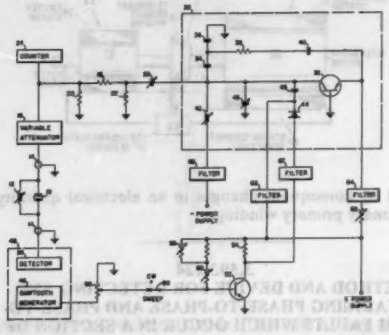
CRYSTAL TESTING APPARATUS FOR USE WITH AN OSCILLOSCOPE

Peter G. Wilhelm, 6710 Elroy Place, Oxon Hill, Md., and Harry T. Shover, 4683 Cedar Ridge Drive, Oxon Hill, Md.

Filed July 16, 1969, Ser. No. 842,318
Int. Cl. G01r *27/00*
U.S. Cl. 324—56 **2 Claims**

Apparatus for quickly determining the characteristics of a crystal. An oscillator, the frequency range of which is varied

by either varying or inserting different impedances in the tank circuit, energizes the crystal being tested. The sawtooth sweep signal of an oscilloscope is used to vary the



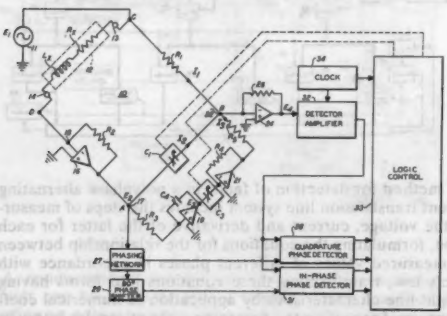
capacitance of a diode which in turn causes the oscillator to sweep through the frequency range broadly set by the tank circuit impedance.

3,593,126

AUTOMATIC SELF-BALANCING OPERATIONAL AMPLIFIER IMPEDANCE BRIDGE

Howard V. May, Winston-Salem, N.C., assignor to Western Electric Company Incorporated, New York, N.Y.

Filed May 16, 1969, Ser. No. 825,266
Int. Cl. G01n *27/00*
U.S. Cl. 324—57 R **6 Claims**



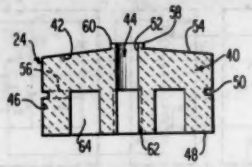
An automatic self-balancing bridge measures the parameters of series L–R or C–R impedances. The bridge proper utilizes operational amplifiers to provide current conversion in one of its product arms and integration and current inversion in its standard arm. The bridge standards may be banks of three terminal capacitors or resistors, which are switched in automatically by relays through a logic-controlled balancing system. The automatic balancing system is based on the phase characteristics of the bridge circuit and includes two phase-sensitive detectors, one for one parameter of the bridge which may be inductance or capacitance and one for resistance. The phase-sensitive detectors control the counting directions of two banks of up-down decade counters, the outputs of which drive the relays and two digital display indicators for the parameters to be measured. The bridge standards may be operated at a fixed frequency independent of the test frequency by providing the apparatus with a heterodyning means.

3,593,127

DIRECTIONAL DISPLACEMENT CAPACITIVE PICKUP

Eugene R. Lucka, Columbus, Ohio, assignor to Reliance Electric and Engineering Company, Columbus, Ohio

Filed June 12, 1968, Ser. No. 736,325
Int. Cl. G01n *27/26*
U.S. Cl. 324—61 **21 Claims**



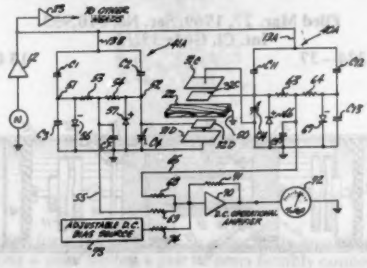
There is disclosed herein a noncontact proximity-sensitive transducer having improved directional properties formed of an elongated rodlike pickup adapted to provide a distance-sensitive variable capacitance and an annular shielding member fitted onto the end of the pickup. The shielding member includes a conducting plane electrically isolated from the pickup, and maintained at the same electrical potential as the object under inspection. The capacity variation serves as a frequency control element to modulate the output in a high frequency oscillator in accordance with the distance variations being measured.

3,593,128

MOISTURE-CONTENT-MEASURING SYSTEM EMPLOYING A SEPARATE BRIDGE CIRCUIT FOR EACH SENSING ELECTRODE THEREOF

William D. Perry, Longview, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed May 21, 1969, Ser. No. 826,569
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 **10 Claims**



The application discloses a moisture-content-measuring system utilizing shielded electrodes arranged in pairs on opposite sides of the material and wherein adjacent pairs of electrodes are energized in an out-of-phase relationship. Each electrode in each pair constitutes a portion of an individual bridge circuit with the arrangement being such that an output signal proportional to the moisture content of the material is derived from each electrode. The signals from each pair of electrodes are then combined and used in an overall system arrangement for determining moisture content. The effects of long cable runs and associated undesirable capacitance effects are avoided through the use of the system disclosed.

3,593,129

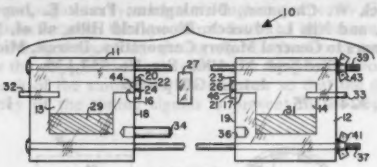
ELECTRICAL TESTING APPARATUS

Robert M. Wade, Wabash; Robert M. Hazelett, Marion, and Walter R. Ring, Montpelier, all of, Ind., assignors to Anaconda Wire and Cable Company

Filed May 21, 1969, Ser. No. 826,420
Int. Cl. G01r *27/02*
U.S. Cl. 324—62 **3 Claims**

For electrically testing articles, such as specimen slabs of plastic, where good electrical contact is required over large

areas of the surface, the present invention provides contact apertures between which the specimen can be pressed and



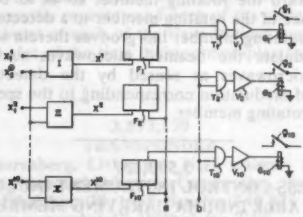
which are then filled with mercury by changing the position of the apparatus.

3,593,130

CIRCUIT FOR A SORTING UNIT OF A PROGRAMMED AUTOMATIC MEASURING DEVICE ESPECIALLY ADAPTED FOR TESTING OF INTEGRATED CONTROL CIRCUITS

Helmut Trautmann, Dresden, Germany, assignor to Arbeitsstelle fur Molekularelektronik Konigsbrucker Landstrasse, Dresden, Germany

Filed Oct. 1, 1968, Ser. No. 764,100
Int. Cl. G01r *17/02*
U.S. Cl. 324—73 R **3 Claims**



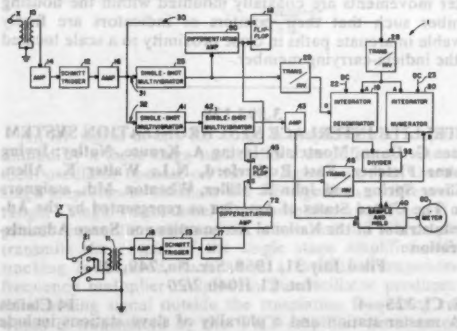
A circuit for a programmed automatic measuring device, especially for integrated circuit testers comprising a plurality of input logics for determining the conformity of measured test results with predetermined standards, with two parallel AND gates, one with input negation, and an OR gate with output negation arranged in series with the AND gates; flip-flops in series with the input logics; and means for automatically conforming the test result to the respective standard if the respective test results is not to be evaluated.

3,593,131

MEANS AND METHOD FOR MEASURING THE PHASE OF AN ALTERNATING ELECTRICAL SIGNAL

Henry Mittel, Jr., Arlington, and Charles J. Stalmach, Jr., Grand Prairie, both of, Tex., assignors to LTV Aerospace Corporation, Dallas, Tex.

Filed June 2, 1969, Ser. No. 829,628
Int. Cl. G01r *25/00*
U.S. Cl. 324—83 A **17 Claims**



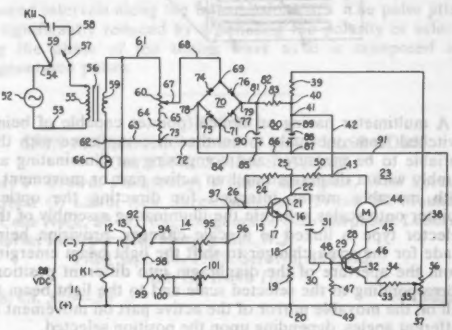
A method and circuitry for measuring the phase difference between two alternating electrical signals wherein one of the signals maintains parameters which are known and the second of the signals bears an unknown, varying phase relationship with respect to the first signal. The integrate modes of a pair of three-mode integrators are simultaneously initiated by a signal responsive to an initial zero-crossing point of a half-cycle of a reference signal, and the hold mode of one of the integrators is initiated by a signal responsive to the next half-cycle zero-crossing point of the reference signal; the hold mode of the second integrator is initiated by a signal responsive to the initial zero-crossing point of a half-cycle of a variable-phase signal. The output signals from the integrators are coupled to an analog divider which output is selectively sampled by sample-and-hold circuitry, and the output signal from the sample-and-hold circuitry is displayed on coupled indicating means. The command signal to the sample-and-hold circuitry is triggered by means responsive to the zero-crossing point of the half-cycle reference signal.

3,593,132

RIPPLE INDICATOR

Walter H. Houck, and James K. Davidson, both of Titusville, Fla., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Apr. 18, 1969, Ser. No. 817,481
Int. Cl. G01r *19/00, 19/22*
U.S. Cl. 324—102 **6 Claims**



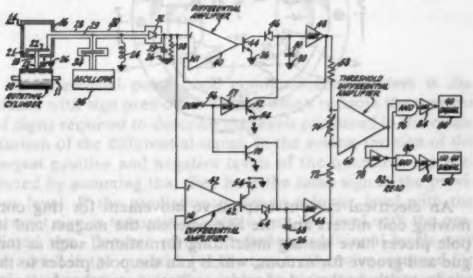
A circuit for monitoring a power supply so as to determine when the voltage level of the power supply deviates. The circuit includes an isolating capacitor which blocks the DC portion of the power supply and allows the AC ripple to pass therethrough. This AC ripple is fed to a balanced circuit which detects variations therein for indicating when the power supply deviates from a predetermined level.

3,593,133

APPARATUS FOR COMPARING TWO DIMENSIONS

Daniel A. Wisner, Detroit, Mich., assignor to RCA Corporation

Filed Dec. 27, 1967, Ser. No. 693,776
Int. Cl. G01r *19/16, 7/00*
U.S. Cl. 324—103 R **4 Claims**



An apparatus is provided for storing a voltage corresponding to one dimension, for storing a second voltage cor-

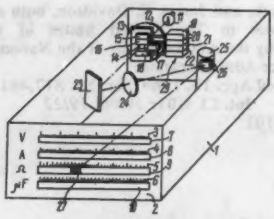
responding to a second dimension, for comparing two voltages, and for indicating whether the difference between the two voltages is within an acceptable range. Such an apparatus can be used to indicate whether the maximum and the minimum diameters of a round object are close enough in value for the round object to be acceptable for use in applications where perfect roundness is desirable.

3,593,134

MULTIMETER COMPRISING ILLUMINATING MEANS WITH A DIAPHRAGM

Boris Abelevich Seliber, ulitsa Rentgena, 15/13, kv. 53, Leningrad, U.S.S.R.

Filed Mar. 11, 1969, Ser. No. 806,108
Claims priority, application U.S.S.R., Mar. 25, 1968, 1228501
Int. Cl. G01r *15/12, 13/38*
U.S. Cl. 324—115 **3 Claims**



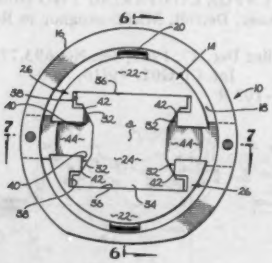
A multimeter having an optical pointer capable of being switched from one scale to another in compliance with the variable to be measured and comprising an illuminating assembly with a diaphragm and an active part or movement a with movable mirror intended for directing the optical pointer onto scales, wherein the illuminating assembly of the selector type is linked to a scale changer, provision being made for the scale changer to shift the light beam emerging from the aperture of the diaphragm into different positions corresponding to the selected scale and to the light beam to fall on the movable mirror of the active part on movement at different angles, depending upon the position selected.

3,593,135

RING CORE METER MOVEMENT

Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation, Los Angeles, Calif.

Filed Apr. 1, 1969, Ser. No. 812,197
Int. Cl. G01r *1/16*
U.S. Cl. 324—151 A **5 Claims**



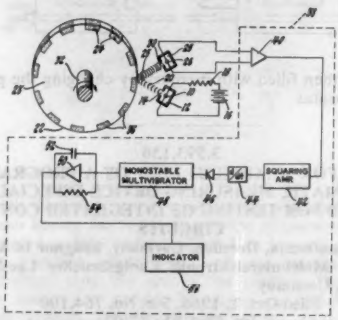
An electrical current responsive movement for ring core moving coil meters and the like wherein the magnet and its pole pieces have mating interfitting formations, such as tongue and groove formations, which join the pole pieces to the magnet without the aid of solder, adhesive, or other fastening means.

3,593,136

SENSING ROTATIONAL SPEED BY AMPLITUDE MODULATING A CONTINUOUS MICROWAVE SIGNAL

Frederick W. Chapman, Birmingham; Frank E. Jamerson, Troy, and Nils L. Muench, Bloomfield Hills, all of, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 11, 1969, Ser. No. 857,135
Int. Cl. G01p *3/36*
U.S. Cl. 324—175 **1 Claim**



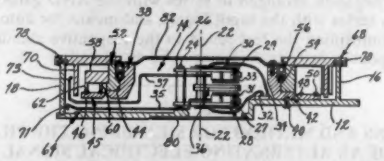
A rotating member speed sensor in which microwaves are beamed toward the rotating member so as to be reflected from a surface of the rotating member to a detector. The surface of the rotating member has grooves therein so as to amplitude modulate the beamed microwaves such that the reflected microwaves as sensed by the detector have a frequency of modulation corresponding to the speed of rotation of the rotating member.

3,593,137

PROCESS CONTROL INSTRUMENT INCLUDING ROTATABLE INDICIA CARRYING MEMBER FOR CHANGING ELECTRICAL OUTPUT SIGNALS

Robert F. Wall, Chesterfield, Mo., assignor to Monsanto Company, Saint Louis, Mo.

Filed Sept. 23, 1968, Ser. No. 761,607
Int. Cl. G01r *1/00*
U.S. Cl. 324—157 **4 Claims**



A display and control instrument consisting of a housing member in which an annular wheellike indicia-carrying member is rotatably mounted. The indicia-carrying wheel member includes leaf contacts which are arranged to be slidably rotated in contact with potentiometer means rigidly secured to the instrument housing member. A plurality of meter movements are coaxially mounted within the housing member such that their pointers or indicators are freely movable in arcuate paths in close proximity to a scale located on the indicia-carrying member.

3,593,138

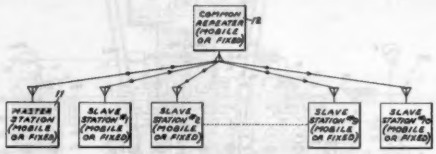
SATELLITE INTERLACE SYNCHRONIZATION SYSTEM

James G. Dunn, Montclair; Irving A. Krause, Nutley; Irving Lane Fletcher, East Rutherford, N.J.; Walter K. Allen, Silver Spring, and John E. Miller, Wheaton, Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed July 31, 1968, Ser. No. 749,121
Int. Cl. H04b *7/20*
U.S. Cl. 325—4 **14 Claims**

A master station and a plurality of slave stations include synchronization equipment to enable each of the stations to

have access to a common repeater in a different time slot of a time division multiplex format at the repeater, there being motion between the stations and the repeater. The master station propagates a sync burst through the repeater. Each of the stations receives this sync burst from the repeater and adjusts the frequency of the timing signals therein to compensate for the doppler shift experienced in the propagation path from each of the stations to the repeater so that the desired frequency of the timing signals is present in the repeater.


COMMON REPEATER (MOBILE OR FIXED)
MASTER STATION (MOBILE OR FIXED)
SLAVE STATION (MOBILE OR FIXED)
SLAVE STATION (MOBILE OR FIXED)
SLAVE STATION (MOBILE OR FIXED)
SLAVE STATION (MOBILE OR FIXED)

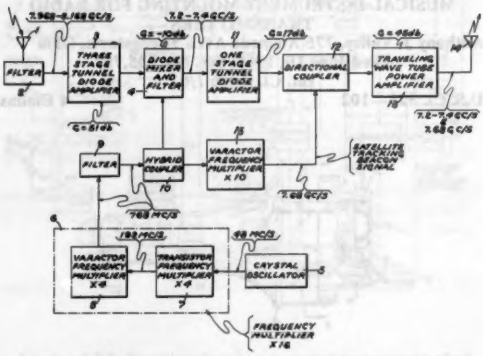
Each of the slave stations also propagates different low power level, psuedo noise code ranging signal through the repeater back to itself which is used to adjust the phase of the timing signals digitally and in an analog manner by means of a motor-driven phase shifter to account for the changing range between the repeater and each of the slave stations so that a data burst of each of the slave stations appears in the proper time slot of the time division multiplex format at the repeater.

3,593,139

TRANSPONDER

David E. Hershberg, Livingston, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed June 28, 1968, Ser. No. 740,870
Int. Cl. H04b *1/59; 7/14*
U.S. Cl. 325—9 **8 Claims**



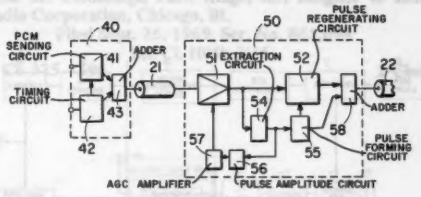
An RF signal in one RF range is amplified and amplitude limited by a three stage tunnel diode amplifier, a mixer and local oscillator operate on the RF signal output of the three stage amplifier to translate the RF signal to a different RF range, a single stage tunnel diode amplifier amplifies and amplitude limits the output of the mixer and a TWT amplifier transmits the output of the single stage amplifier. Where tracking is required, such as in a satellite transponder, a frequency multiplier coupled to the oscillator produces an RF tracking signal outside the translation frequency range which is transmitted by the TWT amplifier simultaneously with the translated RF signal.

3,593,140

PCM TRANSMISSION SYSTEM EMPLOYING PULSE REGENERATORS

Hisashi Kaneko, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed May 5, 1969, Ser. No. 821,667
Claims priority, application Japan, May 10, 1968, 43/31403
Int. Cl. H04b *7/18*
U.S. Cl. 325—13 **3 Claims**



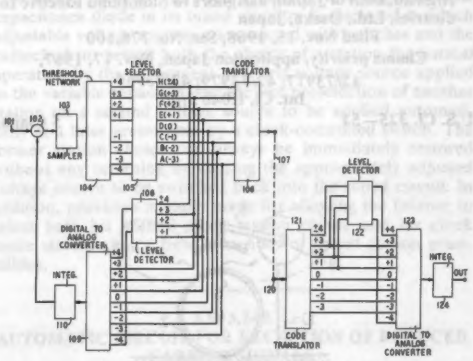
A method and apparatus for reducing the pulse jitter encountered in a pulse code modulated (PCM) transmission path is described. A timing wave is superimposed on a PCM pulse train and utilized to initiate regeneration of pulses at spaced intervals along the transmission path. The pulse jitter is significantly reduced by alternating the polarity or selecting the phase of the timing wave as it is reimposed on regenerated pulses.

3,593,141

SIGN PREDICTION CODING FOR PULSE CODE COMMUNICATION SYSTEMS

Earl F. Brown, Piscataway; William Kaminski, West Portal; John O. Limb, New Shrewsbury, and Frank W. Mounts, Colts Neck, all of, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Sept. 26, 1969, Ser. No. 861,322
Int. Cl. H04b *1/00*
U.S. Cl. 325—38 **4 Claims**

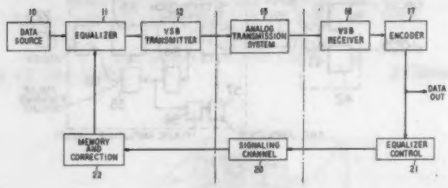


A differential pulse code communication system is disclosed with sign prediction coding which reduces the number of digits required to describe the levels produced in the quantization of the differential signal. In the system the sign of the largest positive and negative levels of the quantizer are predicted by assuming that they have the same sign as the previous level. If the prediction is wrong a lower level with the correct sign is transmitted rather than the level with the predicted sign. Because of the prediction, additional levels may be added in the quantizer in the space otherwise reserved for the signs predicted without increasing the pulse rate of the system.

3,593,142
DIGITAL TRANSMISSION SYSTEM EMPLOYING BAND LIMITED ANALOG MEDIUM WITH ADAPTIVE EQUALIZER AT TRANSMITTER

Stanley L. Freeny, Middletown; Bernard G. King, Rumson, and Thomas J. Pedersen, Lincroft, all of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 20, 1969, Ser. No. 878,340
Int. Cl. H04b *1/00*
U.S. Cl. 325—42 4 Claims

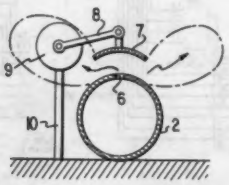


A transmission system for transmitting multilevel digital signals over an analog band limited transmission medium. The digital signals to be transmitted are predistorted by a transversal preequalizer located at the transmitter which operates under the control of equalizer correction signals derived from the output of an analog-to-digital encoder at the receiver; which signals are sent from the receiver to the transmitter over a relatively low-speed signaling or reverse channel. After such predistortion the multilevel signals are transmitted using vestigial sideband techniques so that digital apparatus is required only in the transmitter and receiver with none required at intermediate points.

3,593,143
MOBILE RADIO COMMUNICATION SYSTEM

Tsuneo Nakahara, Nishinomiya-shi, and Hiroshi Kitani, Higashi, both of Japan, assignors to Sumitamo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 15, 1968, Ser. No. 776,100
Claims priority, application Japan, Nov. 17, 1967, 42/73977; 42/73979; 42/73980
Int. Cl. H04b *3/60*
U.S. Cl. 325—51 5 Claims

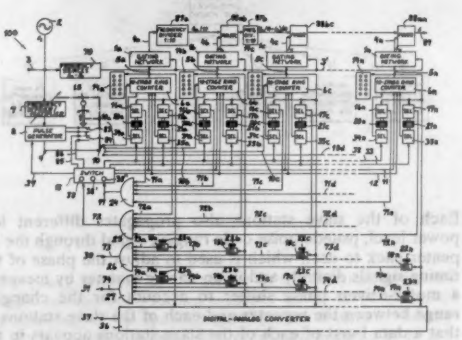


A mobile radio communication system operating between a moving train and a stationary land station comprises a leaky waveguide or the like which is partly opened by providing a plurality of perforations or slits and a controlling device distributed along the waveguide or the like so that the electromagnetic wave transmitted in the waveguide leaks out of the waveguide only at that portion where the train is progressing. The controlling device may comprise a metallic cover to open or close the perforations or slits or matching elements which may vary the leakage impedance through the perforations or slits upon detection of the approaching train.

3,593,144
FREQUENCY GENERATOR WITH DECADIC ADJUSTMENT FOR USE IN FREQUENCY CHARACTERISTICS TESTS

Frank Coenning, Reutlinger, and Gunther Hoffmann, Eningen, both of, Germany, assignors to Wandel u. Goltermann, Reutlinger, Wurttemberg, Germany

Filed Sept. 12, 1968, Ser. No. 759,305
Claims priority, application Germany, Sept. 13, 1967, P 15 91 814.6
Int. Cl. H04b *3/46*; H03b *3/08*
U.S. Cl. 325—67 17 Claims

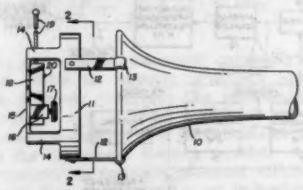


Frequency generator with several decades each having a 10-stage ring counter for the consecutive unblocking of respective frequency gates whose outputs are combined to yield a composite output frequency variable by uniform increments with an a presettable range, the limits of the range and/or intermediate points thereof being determined by a monitoring circuit including lines extending from the several ring counters a coincidence gate so as to generate a signal whenever the ring counters occupy a predetermined position corresponding to a selected output frequency.

3,593,145
MUSICAL INSTRUMENT MOUNTING FOR RADIO TRANSMITTERS

Anthony J. Valley, 775 Alameda Ave., Youngstown, Ohio

Filed June 10, 1968, Ser. No. 735,707
Int. Cl. H04b *1/02*
U.S. Cl. 325—102 4 Claims



The combination of a mounting structure and a miniaturized radio transmitter mounted thereby on a musical instrument such as a trumpet or trombone for picking up and transmitting the sounds of the musical instrument without detracting from the appearance or function of the musical instrument.

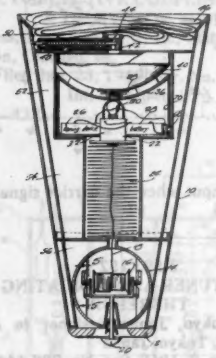
3,593,146
PERSONNEL AND TARGET LOCATOR BEACON

William E. Schriewer, Rt. 2, Box 425 B, New Braunfels, Tex.

Filed Oct. 5, 1967, Ser. No. 672,916
Int. Cl. H04b *1/02*
U.S. Cl. 325—112 2 Claims

A personnel and target locator beacon provided with an inflatable helium balloon from a helium storage tank, a beacon

mounted in a recess having an illuminating light that is observable only from aircraft and not from the ground when the beacon is supported from the balloon, and a 300-foot line releasable from a storage reel upon the beacon structure



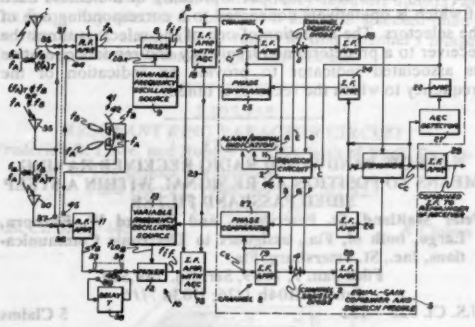
being subject to impact or triggered by a releasable button, upon which conditions the reel becomes free to spin, the balloon becomes inflated from said storage tank, and the beacon light becomes energizable.

3,593,147

EQUAL GAIN DIVERSITY RECEIVING SYSTEM WITH SQUELCH

Richard J. Gurak, Summit, and Milton D. Reicher, Parkridge, both of N.J. and International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Mar. 4, 1969, Ser. No. 804,175
Int. Cl. H04b *7/08*
U.S. Cl. 325—303 **10 Claims**



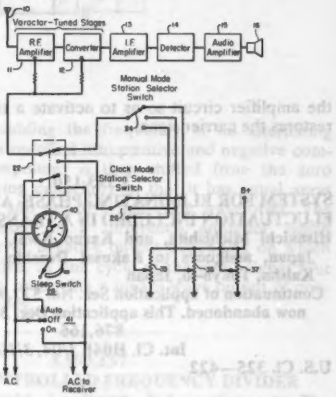
A pair of RF diversity signals are routed to separate channels and heterodyned to two IF signals having the same IF frequency. The IF signals are combined to provide a common IF signal for demodulation. An automatic gain control signal is generated from the common IF signal and is used to control the gain of each IF signal prior to combining to assure a constant amplitude, common IF signal. The common IF signal is also used as a reference signal for a phase comparator in each channel. Each phase comparator compares the phase of its associated IF signal to the reference signal and adjusts its associated IF signal for inphase combining thereof. A squelch diode is included in each channel prior to combining under control of a squelch circuit which responds to the automatic gain control signal and the relative carrier ratios of the two IF signals. The squelch diodes supply no attenuation when the relative carrier ratios are less than a predetermined value and the squelch diode associated with the weaker IF signal supplies substantial attenuation when one of the relative carrier ratios is equal to or greater than the predetermined value. An alarm/normal arrangement is driven by the squelch circuit to indicate critical signal levels for the IF signals.

3,593,148

CLOCK RADIO RECEIVER HAVING PRESETTABLE TIME RESPONSIVE AUTOMATIC VARACTOR TUNING WITH MEMORY FEATURES

Eugene M. Cummings, Park Ridge, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Sept. 25, 1969, Ser. No. 861,098
Int. Cl. H04b *1/16*
U.S. Cl. 325—396 **2 Claims**



A clock radio of the type including a voltage variable capacitance diode in its tuned circuitry is disclosed in which adjustable voltage sources are arranged with switches and the radioclock to permit both the choice of a station for normal operation by the adjustment of a first voltage source applied to the variable capacitor, and the like preselection of another station on a second voltage source to be applied automatically at a later preset time by a clock-controlled switch. The former station choice can always be immediately restored without any returning by causing the appropriately adjusted voltage source to be switched back into the tuned circuit. In addition, provision is easily made for allowing the listener to select both his normal mode station choice and his clock mode station choice from a number of preset station possibilities.

3,593,149

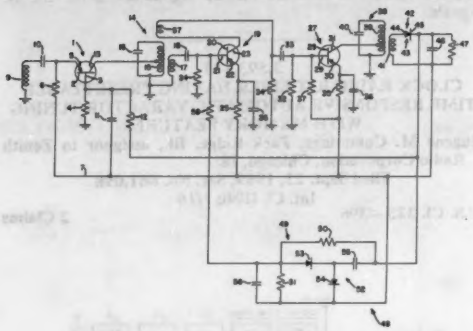
AUTOMATIC CIRCUIT FOR RECEPTION OF REDUCED CARRIER SIGNALS

Joseph A. Worcester, Frankfort, N.Y., assignor to General Electric Company

Filed Jan. 30, 1970, Ser. No. 7,145
Int. Cl. H04b *1/68*
U.S. Cl. 325—329 **7 Claims**

A carrier signal restoration circuit adopted to cooperate with a conventional intermediate frequency amplifier having a standard diode detector connected to the output thereof. The circuit includes a voltage divider connected to the detector output for developing a positive potential indicative of the amplitude of the carrier in the detected signal. A negative potential indicative of the average sideband amplitude in the signal is developed by a pair of voltage doubling diodes and a capacitor also connected to the detector output. When the carrier is attenuated or suppressed, the circuit develops a net

negative potential which increases the conduction of a transistor and the current flow through a feedback winding in



the amplifier circuit so as to activate a tuned circuit which restores the carrier signal.

3,593,150

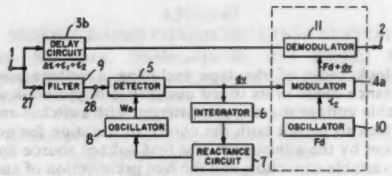
SYSTEM FOR ELIMINATING PHASE- AND FREQUENCY-FLUCTUATION INCLUDED IN A TRANSMITTED SIGNAL

Hisakichi Michishita, and Kazuo Kwai, both of Tokyo-to, Japan, assignors to Kakusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan

Continuation of application Ser. No. 577,952, Sept. 8, 1967, now abandoned. This application Dec. 3, 1969, Ser. No. 876,166

Int. Cl. H04b *3/04, 3/10*

U.S. Cl. 325—422 **6 Claims**



A system for eliminating phase- and frequency-fluctuations in transmitted signals including a reference signal of phase-position or frequency, where the transmission times of the respective signals are at first equalized by passing the transmitted signals through an equilizer compensating the transmission characteristic of a transmission medium at one end of which the fluctuations occur, and the fluctuations included in the transmitted signals are simultaneously eliminated by combining the transmitting signals passed through the equalizing means with a different signal between phase-positions or frequencies of a standard signal of stable phase-position and the transmitted reference signal in synchronous timing of the fluctuations. thereof.

3,593,151

DETECTOR FOR RECEIVER PRINTER STARTUP

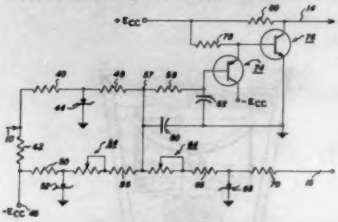
John R. Veale, London, England, assignor to Xerox Corporation, Rochester, N.Y.

Filed Aug. 12, 1968, Ser. No. 752,072

Int. Cl. H04b *1/16;* **H04q** *1/24*

U.S. Cl. 325—466 **6 Claims**

A detector for controlling the startup of a facsimile printing transducer. The detector includes a comparator which activates the transducer when a FM carrier signal of a first frequency is received and enables the facisimile transducer to continue operation until the carrier signal falls below a second frequency corresponding to an adjusted bias applied



to the comparator input when the carrier signal of said first frequency is received.

3,593,152

PUSHBUTTON TUNER AND INDICATING DEVICE THEREFOR

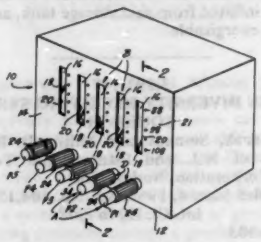
Masatsugu Aoki, Tokyo, Japan, assignor to Alps Electric Company, Limited, Tokyo, Japan

Filed Jan. 2, 1969, Ser. No. 788,444

Claims priority, application Japan, Feb. 16, 1968, 43/11070

Int. Cl. H04b *1/08*

U.S. Cl. 325—352 **20 Claims**



A communication receiver having selectively actuable frequency selectors comprises a plurality of indicators each of which is operatively connected to a corresponding one of the selectors. The actuation of one of the selectors tunes the receiver to a predetermined frequency and renders operative its associated indicator to provide an indication of the frequency to which the receiver is tuned.

3,593,153

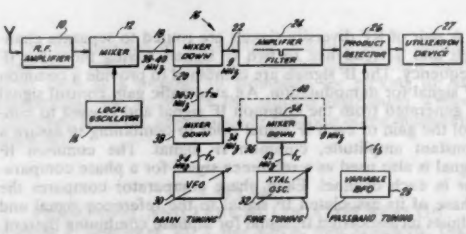
NARROW BANDWIDTH RADIO RECEIVER HAVING MEANS TO POSITION AN RF SIGNAL WITHIN A STEEP SIDED PASSBAND FILTER

Peter Maitland, St. Petersburg, and Richard W. Ehrhorn, Largo, both of, Fla., assignors to Electronic Communications, Inc., St. Petersburg, Fla.

Filed Jan. 7, 1969, Ser. No. 789,501

Int. Cl. H04b *1/26;* **H03d** *7/16*

U.S. Cl. 325—432 **5 Claims**



A narrow bandwidth radio receiver is described wherein pass band tuning of an RF signal is accomplished by using a variable beat frequency oscillator (BFO) signal to alter an injection frequency in a direction to selectively position an RF

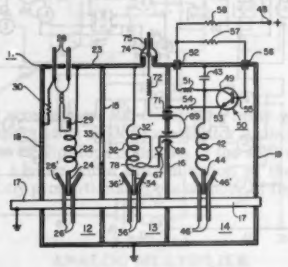
signal within a passband filter having a steep side without changing the relationship between the RF signal and the BFO signal.

3,593,154

FREQUENCY-SELECTIVE COUPLING NETWORK FOR A TELEVISION TUNER

David A. Blass, Elmwood Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 28, 1969, Ser. No. 794,518
Int. Cl. H04b *1/26*
U.S. Cl. 325—437 8 Claims



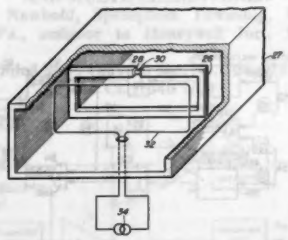
Tuning to a desired television channel, while rejecting its image channel, is accomplished by a novel coupling network combining a frequency selector and an image rejection trap simultaneously tunable to different frequencies by means of a single common tuning element. By the adjustment of a variable air capacitor, shunt connected to the primary inductor of a transformer, the frequency selector may be tuned to maximize the response of the coupling network to a selected television channel. The image rejection trap is formed by the mutual inductance and capacity coupling between the primary inductor and a secondary inductor of the transformer. Variations of the air capacitor effect changes in the coefficient of capacitive coupling between the inductors, with the result that the trap tracks the frequency selector; namely, as the frequency selector is tuned to a different selected channel the trap is automatically tuned to that channel's image frequency to achieve image signal suppression.

3,593,155

RESONANT RING VARACTOR CIRCUIT

Frederick B. Lowe, and Robert G. Leib, both of York, Pa., assignors to The Bendix Corporation

Filed Dec. 27, 1968, Ser. No. 787,423
Int. Cl. H04b *1/26*
U.S. Cl. 325—445 9 Claims



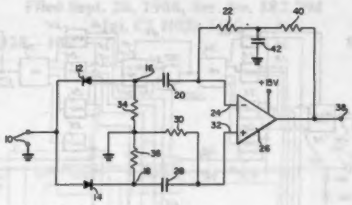
A waveguide has disposed coaxially therein and perpendicular to the axis of microwave propagation a resonant ring structure including a varactor bridging an electrical discontinuity in the ring. The structure is used as a switch, tunable filter or up-converter by suitably biasing the varactor from an outside biasing source. For use as a frequency multiplier or limiter the varactor generally needs no external biasing source.

3,593,156

FREQUENCY DOUBLER

Harley D. Jordan, South Daytona, Fla., assignor to General Electric Company

Filed Dec. 31, 1968, Ser. No. 788,145
Int. Cl. H03k *5/153*
U.S. Cl. 328—20 5 Claims



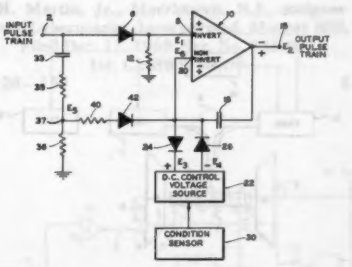
A circuit for doubling the frequency of an alternating signal. The signal is rectified into positive and negative components. Each component is then shifted from the zero reference by blocking capacitors so that it has equal areas under the positive and negative half-cycle waveforms. The signals are compared in a difference amplifier which produces a positive or negative output depending on which input is more positive. In one cycle of the input signal four such changes occur, producing a square wave output of double the input frequency.

3,593,157

VOLTAGE-CONTROLLED FREQUENCY DIVIDER

Henry R. Kosakowski, Lyndhurst, N.J., assignor to The Bendix Corporation

Filed May 29, 1969, Ser. No. 828,927
Int. Cl. H03k *25/02*
U.S. Cl. 328—41 9 Claims

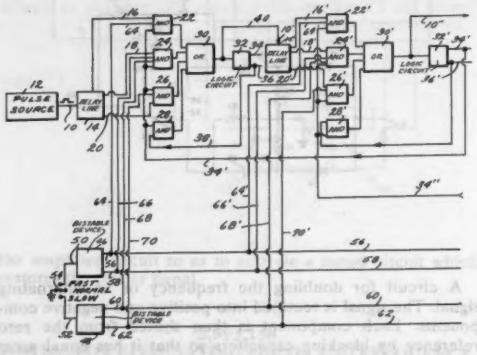


A frequency divider comprising a one-shot multivibrator operated by a fixed frequency pulse train applied to one of its inputs and controlled by a voltage signal to provide an output pulse train having a frequency corresponding to the voltage signal. The output pulse train is fed back to a second input of the multivibrator through a decay network to switch the multivibrator and the decay time t is controlled by the voltage signal. The frequency of the output pulse train is determined by the decay time t is controlled by the voltage signal. The frequency of the output pulse train is determined by the decay time t and varies from $1/t$ c.p.s. to the frequency of the input pulse train as determined by the magnitude of the voltage signal.

3,593,158
VARIABLE FREQUENCY PULSE GENERATOR

Richard C. Day, New Brighton; Frederick M. Green, Bloomington, and William A. Mitchell, Bloomington, all of, Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed June 4, 1969, Ser. No. 830,446
Int. Cl. H03k 5/159
U.S. Cl. 328—55 10 Claims

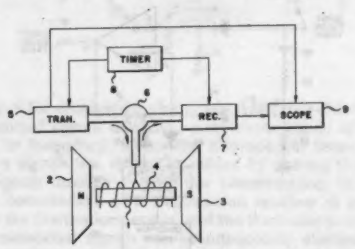


A variable timing system for use with digital devices or computers wherein the system includes a plurality of stages and whereby the system enables the selection of a predetermined rate and length of the timing pulses whereby the timing of at least a portion of the associated computer is controlled by the system of this invention.

3,593,159
RF ECHO APPARATUS

Daniel E. Kaplan, Los Altos Hills; Robert M. Hill, Palo Alto; Gabriel F. Herrmann, Los Altos Hills, and Stephen K. Ichiki, Los Altos Hills, all of, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 23, 1968, Ser. No. 786,078
Int. Cl. H03f 9/00
U.S. Cl. 330—63 11 Claims

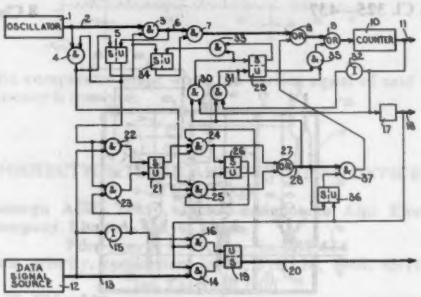


RF echo apparatus in which the echo signal pulse is amplified with respect to the signal pulse, such apparatus being characterized by broadband, high signal-to-noise operation at room temperatures and being particularly useful in various forms of signal processing such as, for example, delaying, amplifying, detecting, compressing and expanding RF pulses. These characteristics are obtained by a new echo forming mechanism in which the sample is characterized by collective particle oscillation modes which are substantially localized with a nonlinear coupling between modes. Such coupling introduces a mode instability during the drift period prior to echo which causes amplification of the echo pulse. In the example described in detail, the sample is the form of a ferrite having structural discontinuity with pulses being coupled to and from the sample through a broadband slow wave structure.

3,593,160
CLOCK-SYNCHRONIZING CIRCUITS

John Richard Moore, Weston, near Crewe, England, assignor to International Computers Limited, London, England

Filed Nov. 21, 1968, Ser. No. 777,843
Claims priority, application Great Britain, Nov. 21, 1967, 53020/67
Int. Cl. H04l 7/00
U.S. Cl. 328—63 6 Claims

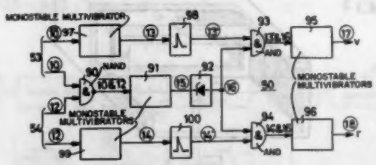


A system for the generation of clock signals in a data processing apparatus is disclosed, in which the clock signals are developed from a source of higher frequency pulses. The clock signals are applied to an apparatus in which data signals are represented in nonreturn-to-zero (NRZ) manner, and the clock signals are synchronized to the occurrence of changes in data item representation. It is recognized that the synchronization of the signals may vary and, in particular that there is a condition of spurious synchronization in which the clock signals may occur 180° out of phase with data changes. The system proposed is arranged to recognize both variations in synchronism and the spurious synchronism condition and to correct the relative timing between clock and data change signals to bring the system into true synchronism by modifying the application of the higher frequency pulses to a clock signal generating countdown arrangement.

3,593,161
PULSE COINCIDENCE DETECTION CIRCUIT

Gerold Ritz, deceased, late of Stuttgart, Germany, and Erika Ritz, Gerold Ritz and Anna Ritz, all legal successors, all of Tiengen, Hochrhein, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 6, 1968, Ser. No. 782,009
Claims priority, application Switzerland, Dec. 20, 1967, 18011/67
Int. Cl. H03k 5/20
U.S. Cl. 328—109 6 Claims

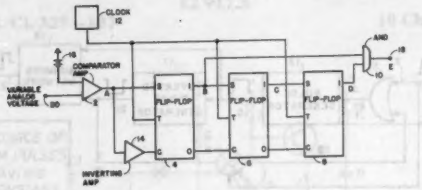


Simultaneous pulses occurring in two or more pulse trains are suppressed, and only discretely appearing pulses of a minimum time separation are propagated. A circuit detects coincidence, by time-extending a pulse representative of the inverse of the logical conjunction of both pulses. The time-extended, inverted pulse is used as an information signal indicative of noncoincidence to control AND gates to another input of which, the pulses, regenerated from the trailing edges of the pulses of the pulse trains, are applied.

3,593,162
ANALOG COMPARATOR

James R. Patmore, Neptune, N.J., assignor to Electronic Associates Inc., Long Branch, N.J.

Filed Mar. 25, 1969, Ser. No. 810,195
Int. Cl. H03k 5/20
U.S. Cl. 328—111 2 Claims

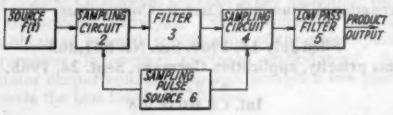


A circuit arrangement for eliminating noise-generated ambiguous outputs of an analog comparator is disclosed providing a number of flip-flops operating in the shift register mode resulting in a pulse width discrimination of the comparator output directly proportional to the number of flip-flops.

3,593,163
ANALOG MULTIPLIER

Remi Quet, Hardy Mantes-la-Ville, and Marc Jules Theodore Schneider, Versailles, both of, France, assignors to International Standard Electronic Corporation, New York

Filed Mar. 6, 1969, Ser. No. 804,885
Int. Cl. G06g 7/16
U.S. Cl. 328—160 6 Claims

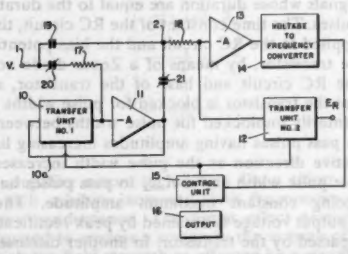


An analog circuit to multiply signal $f(t)$ by a signal $g(t)$, where signal $g(t)$ has limited duration and zero as its initial and final amplitudes. $f(t)$ is sampled at a first predetermined frequency. The resultant PAM is filtered by a first filter having a predetermined impulse response proportional to $g(t)$. The output of the first filter is sampled at a second predetermined frequency different than the first sampling frequency. The result of the second sampling is filtered by a low pass filter having a predetermined cutoff frequency. The first and second predetermined frequency, the predetermined impulse response and the predetermined cutoff frequency determine the precision of the resultant product.

3,593,164
ELECTRIC LINEAR AND SQUARE ROOT INTEGRATOR AND MULTIPLIER/DIVIDER

William F. Newbold, Springfield Township, Montgomery County, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 1, 1968, Ser. No. 709,575
Int. Cl. H04b 1/04
U.S. Cl. 328—144 2 Claims

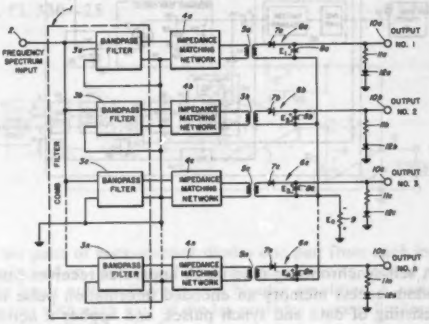


A circuit is provided for performing various arithmetic operations. These arithmetic operations include linear integration, square root extraction, multiplication and division. The circuit includes an integrator having capacitive transfer, sampling and holding circuits. A voltage-to-frequency converter network is interconnected by operational amplifiers.

3,593,165
COMB FILTER WITH MAXIMUM VALUE SIGNAL SELECTION CIRCUIT

Jack L. Grubbs, Jr., Silver Spring, Md.

Filed Sept. 26, 1966, Ser. No. 582,794
Int. Cl. H03k 5/20
U.S. Cl. 328—149 8 Claims

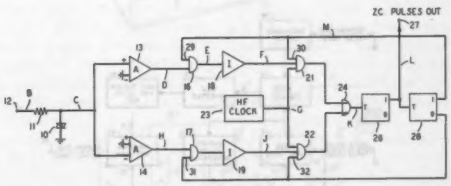


A maximum value signal selection circuit having a plurality of channels connected to receive signals from band-pass filters in a comb filter arrangement which rectifies and filters the signals and subtracts a voltage proportional to the sum of the rectified signals from each of the signals to provide a plurality of outputs wherein only the maximum signal channel produces a positive voltage.

3,593,166
ZERO CROSSING DETECTOR

William H. Martin, Jr., Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 17, 1969, Ser. No. 885,807
Int. Cl. H03k 17/00
U.S. Cl. 328—150 5 Claims

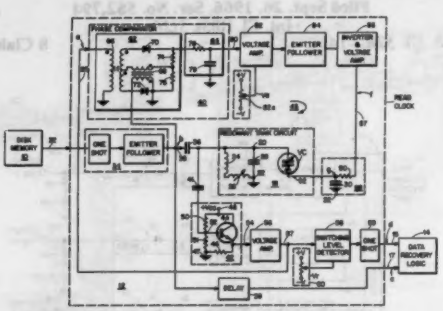


A pulse of controllable width is emitted from a pulse divider in response to each zero crossing of an input signal. The input signal polarity is sensed, and a separate gate for each polarity gates pulses from a clock oscillator to the pulse divider in response to the termination of that particular input polarity. The pulse divider produces one pulse out for a fixed even number of clock pulses received, and a flip-flop alternately disables each gate to block the clock pulses after one output pulse. The clock oscillator frequency and the pulse division rate determine the output pulse width.

3,593,167
SYNCHRONOUS READ CLOCK APPARATUS

Michael A. Koulopoulos, Watertown, Mass., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Jan. 28, 1969, Ser. No. 794,576
Int. Cl. H03b 3/04
U.S. Cl. 328—155 9 Claims

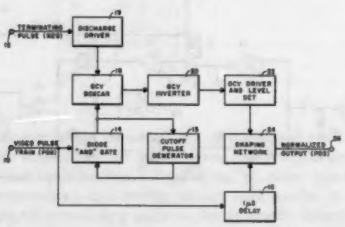


A self-synchronizing read clock apparatus receives from a random access memory an encoded information pulse train consisting of data and synch pulses, and applies it across a normally inactive resonant tank circuit. The tank circuit generates a periodic sinusoidal reference signal, and a detection circuitry derives a reference timing train from reference points of the sinusoidal reference signal. The apparatus includes circuitry which delays the input data train to coincide with other reference points of the same reference signal and, further, has circuitry for generating an error voltage whose magnitude is proportional to the discrepancy in phase between the data train and reference signal and applies a correction voltage to the tank which adjusts the frequency to decrease the discrepancy in phase at a critically damped rate.

3,593,168
VIDEO PULSE NORMALIZER

Criley Orton, Arlington, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 31, 1966, Ser. No. 576,780
Int. Cl. H03k 5/08
U.S. Cl. 328—168 7 Claims

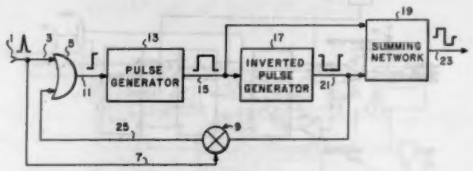


A circuit for normalizing over a wide video input range, the first pulse of a chain of pulses whose relative amplitude ratios contain information. The video input pulses are applied to a resistance divider and the output is taken from a junction within the divider. The second, or lower resistor resistance value is changed in inverse ratio to the amplitude of the first video pulse so that the output amplitude of the first pulse remains constant.

3,593,169
TONE BURST GENERATOR

Elliott W. Markow, Burlington, Mass., assignor to Newton Electronic Systems, Inc., Waltham, Mass.

Filed Sept. 16, 1969, Ser. No. 858,413
Int. Cl. H03k 1/12
U.S. Cl. 328—223 12 Claims

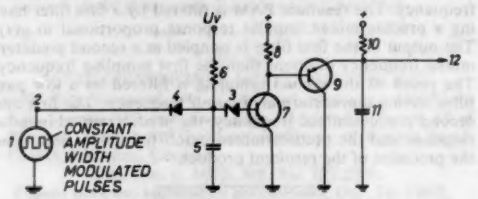


A tone burst generator for applying balanced signals to a transmission line, comprising complementary pulse generators connected in series and a switching circuit connected between the output terminal of one and the input terminal of the other. The switching circuit is enabled by the presence of a signal applied to one of the pulse generators. A summing amplifier combines the outputs of the pulse generators for application to a transmission line.

3,593,170
PULSE-WIDTH DISCRIMINATOR HAVING CONDUCTION CONTROLLED MEANS

Gerhard Gunter Gassmann, Berkheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 15, 1969, Ser. No. 841,863
Claims priority, application Germany, Sept. 24, 1968, P 17 62 921.9
Int. Cl. H03k 9/8
U.S. Cl. 329—106 10 Claims



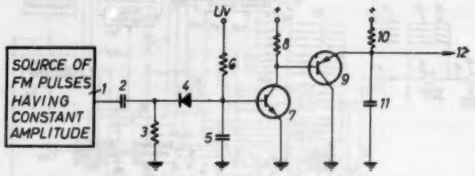
A pulse-width discriminator providing a very steep discriminator characteristic. The width modulated input pulses limited to a constant amplitude are rectified and applied to an RC time constant circuit prior to being applied to a transistor whose conduction is controlled by resultant linear sawtooth signals whose duration are equal to the duration of the input pulses. The time constant of the RC circuit, the bias potential applied to the RC circuit and the bias potential applied to the transistor, by means of a Zener diode coupled between the RC circuit and base of the transistor, are so selected that the transistor is blocked for pulse widths below ti_{min}, momentarily unblocked for pulse widths between ti_{max} and ti_{min} to pass pulses having amplitudes increasing linearly in the negative direction as the pulse width increases, and saturated for pulse width above ti_{max} to pass pulses having a negative going constant maximum amplitude. The discriminator output voltage is obtained by peak rectification of the pulses passed by the transistor. In another disclosed embodiment, the discriminator output voltage is passed through a low pass filter to provide the bias potential coupled to the RC circuit.

3,593,171

FREQUENCY DISCRIMINATOR HAVING CONDUCTION CONTROLLED MEANS

Gerhard Gunter Gassmann, Berkheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 15, 1969, Ser. No. 841,764
Claims priority, application Germany, Sept. 21, 1968, P 17 62 917.3
U.S. Cl. 329—102 10 Claims



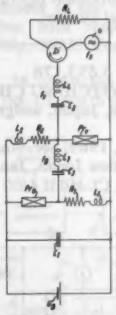
A frequency discriminator for frequency-modulated (FM) pulse signals having a steep discriminator characteristic. The FM pulse signals are amplitude limited, differentiated and then rectified. The time constant of a subsequent RC circuit and the fixed bias applied to the RC circuit are so selected to produce a linear sawtooth signal having a duration equal to the period of the FM pulse signals so that a subsequent transistor is always blocked at pulse frequencies above f_{max}, unblocked momentarily at pulse frequencies between f_{min} and f_{max} to pass pulses with an amplitude increasing in the negative direction linearly as the frequency decreases, and passes constant maximum negative going amplitude pulses at pulse frequencies below f_{min}. The discriminator output voltage is obtained by peak rectification of the pulses passed by the transistor. In another disclosed embodiment, the discriminator output voltage is passed through a low pass filter to provide the bias for the RC circuit.

3,593,172

SEMICONDUCTOR AMPLIFIER

Berthold Bosch, Ulm; Wolfgang Heinle, Neu-Ulm, and Reinhart Engelmann, Ulm, all of, Germany, assignors to Telefunken Patentverwaltungsgesellschaft m.b.H., Ulm am Danube, Germany

Filed Aug. 21, 1969, Ser. No. 851,898
Claims priority, application Austria, Aug. 21, 1968, 8158/68
Int. Cl. H03b 7/06
U.S. Cl. 330—5 13 Claims



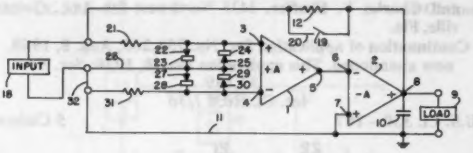
An amplifier circuit including a Gunn effect semiconductor which exhibits increased limit frequencies and higher negative conductance. The Gunn effect semiconductor is constructed to possess a region in the vicinity of its cathode in which the field strength as effected by a steady state biasing voltage lies between the critical value at which the Gunn oscillation is initiated and a lower value at which the Gunn oscillation is extinguished, while the remainder of the semiconductor body possesses a field strength less than such lower value. The first region is periodically pulse triggered to initiate the Gunn oscillation, the period between pulses being approximately equal to the transit time of a high field zone through the semiconductor body. The triggering pulses may be produced by a second Gunn element or they may be produced in the first Gunn element itself.

3,593,173

INPUT LIMITING FOR BIPOLAR OPERATIONAL TRANSISTOR AMPLIFIER

Sarkis Nercessian, Long Island City, N.Y., assignor to Forbro Design Corp., New York, N.Y.

Filed Dec. 30, 1968, Ser. No. 787,776
Int. Cl. H03f 1/02; G06g 7/12
U.S. Cl. 330—25 8 Claims



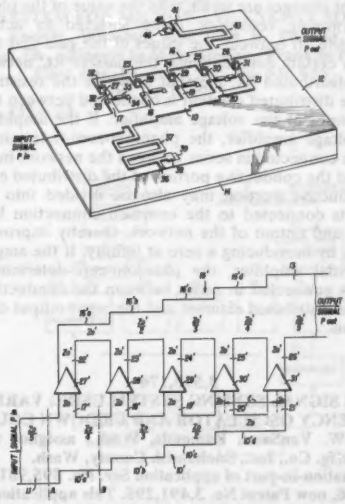
Two pairs of back-to-back diodes one pair from each input terminal of an operational amplifier to a floating neutral provides input voltage limiting in a bipolar amplifier. A resistor in series with each pair of diodes provides current limiting to the voltage limiting diodes.

3,593,174

SOLID STATE AMPLIFIER FOR MICROWAVE FREQUENCY SIGNALS

Marvin H. White, Laurel, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 5, 1969, Ser. No. 830,671
Int. Cl. H03f 3/60
U.S. Cl. 330—53 8 Claims



A solid state apparatus for amplifying signals in the microwave frequency range by phase coherent addition of the signal output of a plurality of amplifier elements achieves high power output and wide bandwidth operation, with im-

proved signal-to-noise ratio while operating within the permissible limits of power gain for each of the amplifying elements. A plurality of parallel connected, solid state amplifiers are connected at equally spaced distances between tapered input and output transmission lines which, respectively, distribute microwave power equally to each of the parallel connected amplifier elements and provide for phase coherent addition of the signal outputs of each of the amplifier elements.

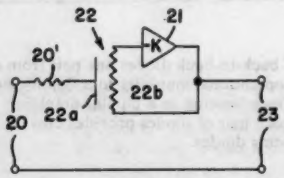
ERRATUM

For Class 330—63 see:
Patent No. 3,593,159

3,593,175
ACTIVE RC NETWORKS

T. O. Paine, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of; William J. Kerwin, 1981 Shalimar Way, Tucson, Ariz., and Charles V. Shaffer, 3425 Northwest 8th Ave., Gainsville, Fla.

Continuation of application Ser. No. 751,265, Aug. 8, 1968, now abandoned. This application May 8, 1970, Ser. No. 33,159
Int. Cl. H03f *1/36*
U.S. Cl. 330—107 **5 Claims**



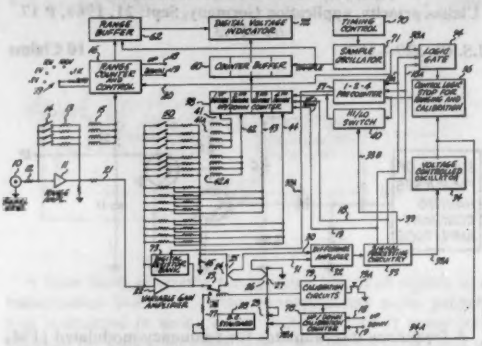
An active RC network formed by a voltage amplifier and a passive RC feedback network connected in a negative feedback loop with the amplifier. The negative feedback network is able to receive a resistance such that when the resistance is zero, there are no zeros in the transmission of the feedback network (phantom zeros), and when the resistance is finite, there are complex conjugate phantom zeros in the right half of the complex frequency plane. For any given value of the quality factor Q of the network response, both the required amplifier gain and the sensitivity of the circuit to gain and component changes are small, with the value of the phantom-zero-determining resistance being selected to achieve a desired trade-off between the values of the gain and the sensitivity. In certain embodiments, the passive RC network includes a distributed RC element in which the resistive portion of the distributed element is connected between the output and input of the voltage amplifier. If the amplifier is a simple voltage amplifier, the phantom-zero-determining resistance is connected in series between the network input terminals and the conductive portion of the distributed element. This conductive portion may also be divided into one or more parts connected to the common connection between the input and output of the network, thereby improving the selectivity by introducing a zero at infinity. If the amplifier is a differential amplifier, the phantom-zero-determining resistance is connected in series between the conductive portion of the distributed element and the input-output common connection.

3,593,176
ERROR SIGNAL SENSING SYSTEM USING VARIABLE FREQUENCY OSCILLATOR AND UP/DOWN COUNTER

Richard W. VanSaun, Edmonds, Wash., assignor to John Fluke Mfg. Co., Inc., Snohomish County, Wash.

Continuation-in-part of application Ser. No. 595,981, Nov. 21, 1966, now Patent No. 3,491,295. This application Apr. 14, 1969, Ser. No. 815,703
Int. Cl. H03g *3/20*
U.S. Cl. 330—137 **5 Claims**

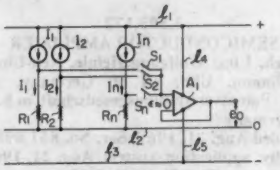
A feedback and control system for adjusting the gain of an amplifier associated with an input circuit so that such adjustment will automatically reduce the error between a standard signal and an input signal. The adjustment required then provides an indication of a given value of the input signal with substantially no load being imposed on the source providing the input signal. A voltage controlled oscillator responsive to error signals generated when the output of the amplifier is compared to a known standard signal is utilized in the feedback circuit in combination with an up/down counter. The system of the preferred embodiment operates to correct the error signal at a rate proportional to the error. Details of an R.M.S. meter incorporating the present invention are provided.



3,593,177
INPUT SWITCHING CIRCUIT

Masayoshi Tanaka, Tokyo, Japan, assignor to Honeywell Inc, Minneapolis, Minn.

Filed Jan. 21, 1969, Ser. No. 792,444
Claims priority, application Japan, Jan. 19, 1868, 43-2922
Int. Cl. H03f *1/00*
U.S. Cl. 330—185 **2 Claims**

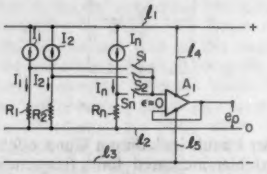


A single signal current is selected from a plurality of signal currents of varied levels, is amplified and is supplied to means for effecting measurement operation or signal conversion of the amplified signal current.

3,593,178
INPUT SWITCHING CIRCUIT

Masayoshi Tanaka, Tokyo, Japan, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 21, 1969, Ser. No. 792,634
Claims priority, application Japan, Jan. 19, 1968, 43/2607
Int. Cl. H03f *1/00*
U.S. Cl. 330—185 **3 Claims**



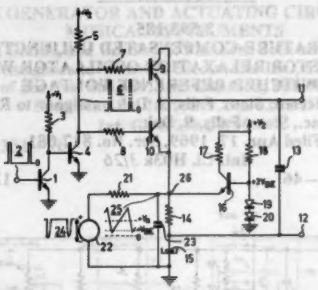
A single signal current is selected from a plurality of DC signal currents of varied levels and is transmitted to means for performing measurement, operation and signal conversion.

3,593,179

PHASE DISCRIMINATOR FOR SYNCHRONIZING A LOCAL OSCILLATOR

Paulus Joseph Maria Hovens, and Wouter Smeulers, both of Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1969, Ser. No. 868,300
Claims priority, application Netherlands, Oct. 31, 1968, 68/5507
Int. Cl. H03b 3/04
U.S. Cl. 331—8 10 Claims



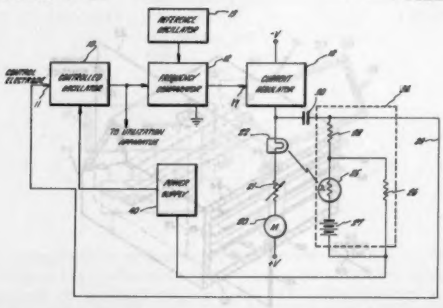
A phase discriminator for synchronizing a local oscillator, particularly for the synchronization of the line deflection in a television receiver. The discriminator is provided with a semiconductor switch and a control stage connected to a control electrode of the switch. The control stage provides, under the influence of an external synchronizing signal applied thereto, a switching signal having short switching pulses relative to a reference potential for closing the semiconductor switch. A source for supplying a comparison signal derived from the oscillator signal can be connected through the switch to a capacitor which conveys a control voltage for a frequency control stage of the oscillator. The discriminator further comprises a peak rectifier circuit having a terminal to which the source is connected. The peak rectifier circuit includes a potential divider which provides a threshold in the comparison signal relative to the reference potential occurring in the switching signal which is applied to the control electrode of the switch by the control stage during the absence of switching pulses; the threshold introduced in the comparison signal maintaining the semiconductor switch open during the absence of switching pulses.

3,593,180

SYSTEM FOR CONTROLLING THE OPERATION OF A VARIABLE SIGNAL DEVICE

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of Richard Bauer Kolbly, 26335 Community Blvd., Barstow, Calif.

Filed Nov. 26, 1969, Ser. No. 880,248
Int. Cl. H03b 3/04
U.S. Cl. 331—10 7 Claims



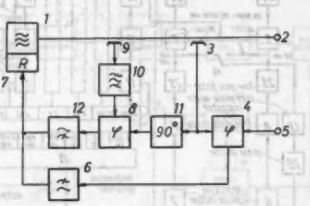
A system for controlling the operation of a variable signal generator is disclosed. The system includes an error generator which provides an output which varies as a function of the difference between the instantaneous output signal value of the variable signal generator and a reference signal value. A variable light source emits light of an intensity corresponding to the error signal level. An electrically isolated light dependent control signal generator including a photoresistive voltage divider is disposed in optical communication with the light source. The control signal generator provides signals to the control terminal of the variable signal generator to regulate its operation.

3,593,181

OSCILLATOR SYSTEM

Hans Kuhn, Oberer Wingertweg, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 5, 1969, Ser. No. 874,164
Claims priority, application Germany, Nov. 15, 1968, P 18 09 005.6
Int. Cl. H03b 3/04
U.S. Cl. 331—12 4 Claims



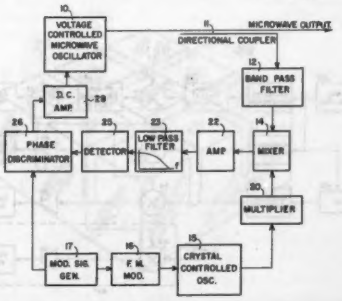
To minimize the noise of an oscillator whose frequency is controlled by a reference signal via a control loop, the output of the oscillator is applied to the two inputs of a phase demodulator via a high-Q tuned circuit and a 90° phase shifter respectively. In one embodiment the phase demodulator output is coupled via a high pass filter into the usual frequency controlling loop. In a second embodiment, the DC component in the control loop is coupled via a reactance stage into the high-Q tuned circuit.

3,593,182

AFC SYSTEM FOR MICROWAVE ENERGY SOURCES

Stanley Roelofs, Wheaton, and John R. Buckley, Chicago, both of, Ill., assignors to Motorola Inc., Franklin Park, Ill.

Filed Apr. 16, 1969, Ser. No. 816,655
Int. Cl. H03b 3/04
U.S. Cl. 331—23 7 Claims



The output of a microwave oscillator is mixed with an FM modulated crystal controlled reference frequency to develop a difference frequency. The resulting difference frequency is filtered in a low pass filter having a predetermined slope and detected. The detected modulation signal has a phase angle according to whether the output signal is greater or less than the reference signal. The detected modulation signal is com-

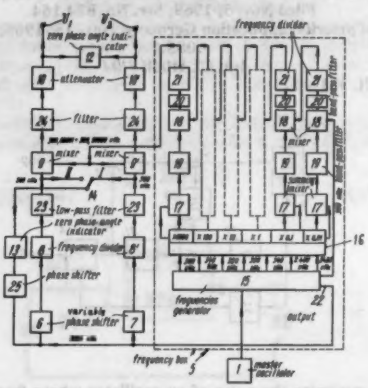
pared in a phase sensitive discriminator with the reference modulation signal to develop a DC signal which is applied to the microwave oscillator to change the frequency thereof.

3,593,183

VERY LOW AND LOW FREQUENCY PRECISION PHASE CALIBRATOR

Svyatoslav Anatolievich Kravchenko, Kirovsky prospekt, 65, kv. 29, and Evgeny Dmitrievich Koltik, B. Porokhovskaya ul. 54, korp 2 kv. 77, both of Leningrad, U.S.S.R.

Filed Aug. 5, 1968, Ser. No. 750,139
Int. Cl. H03b *21/02, 27/00*
U.S. Cl. 331—38 **2 Claims**



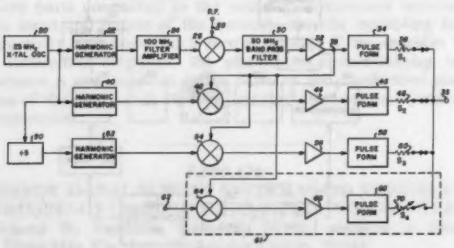
A precision phase calibrator for reproducing two sinewave signals with preset phase relations in the very low and low frequency range by using one master oscillator and connecting into a two-channel circuit at least one phase shifter at the input of frequency dividers connected at the input of two mixers.

3,593,184

COMB MARKER GENERATING APPARATUS FOR SIMULTANEOUSLY PROVIDING A PLURALITY OF MARKER PULSES AT DIFFERENT INDIVIDUALLY IDENTIFIABLE MARKER INTERVALS

Jose Luis Herrero, Mountain View, Calif., assignor to The Singer Company, New York, N.Y.

Filed Nov. 20, 1969, Ser. No. 878,463
Int. Cl. H03b *21/02*; **H03k** *3/00*
U.S. Cl. 331—38 **14 Claims**



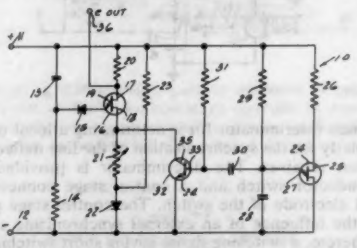
Comb marker generator apparatus for simultaneously providing a number of sets of marker pulses having different marker intervals and having marker interval identifiable characteristics. A means is provided for generating a harmonic spectrum of a reference frequency high enough to make it a simple matter to obtain enough harmonics to cover the desired frequency range. This harmonic spectrum is then mixed with an unknown signal to provide a difference frequency from which marker pulses at the reference frequency can be generated. Marker pulses at frequency intervals of less than the selected reference frequency are provided by mixing one or more submultiples of the reference frequency with said difference frequency to provide pulses which can then be added to the reference frequency pulses to simultaneously provide markers at several frequency intervals. Means are provided at each source for controlling the amplitude or other characteristic of a set of pulses so that a set of pulses at one marker interval can be distinguished from those of other marker intervals.

3,593,185

TEMPERATURE-COMPENSATED UNIJUNCTION TRANSISTOR RELAXATION OSCILLATOR WITH SWITCHED REFERENCE VOLTAGE

Carl W. Andersen, Sioux Falls, S. Dak., assignor to Raven Industries, Inc., Sioux Falls, S. Dak.

Filed Apr. 17, 1969, Ser. No. 817,081
Int. Cl. H03k *3/26*
U.S. Cl. 331—46 **12 Claims**



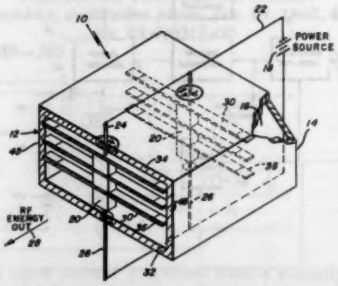
Temperature-compensated pulse-generating apparatus employs a complementary unijunction transistor as a threshold detector in a bridge-type comparator circuit for generating output pulses. A unijunction relaxation oscillator operatively controls an electronic switch which, in turn, controls the operation of the complementary unijunction transistor in a switching mode to effectively multiply the peak point current available to the complementary unijunction transistor. The cycle of the output pulses is determined by the delay of an RC timing circuit provided in the comparator circuit, the time constant of the timing circuit being controlled by selectively connecting therein of a timing resistance. The optional provision of the output pulses to shift registers provides easily programmed very long time delays wherein the total time thereof is controlled through a switch for selectively changing the value of the timing resistance.

3,593,186

THERMAL DISSIPATION IN SEMICONDUCTOR DEVICE ARRAYS

Edward C. Dench, Annisquam, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 18, 1969, Ser. No. 800,169
Int. Cl. H03b *7/14*; **H03f** *3/10, 3/60*
U.S. Cl. 331—52 **6 Claims**



Semiconductor devices individually as well as in stacked arrays for operation at increased electrical power levels are

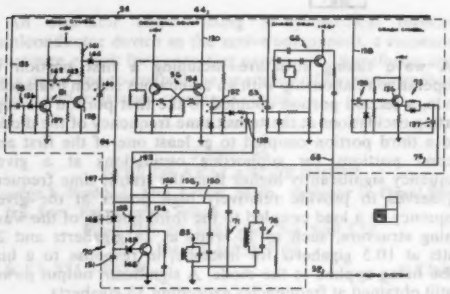
supported by heat sink structures of a conductive material within a transmission line section to generate oscillations at microwave frequencies. Dissipation of the thermal energy generated, particularly in such devices operated at high power densities and exhibiting negative resistance characteristics in enhanced by the increased radiation surfaces coupled to the semiconductor. The semiconductor devices are electrically insulated DC-wise when mounted within the transmission line which also serves as the circuit for the generation of the AC field.

3,593,187

NOISE GENERATOR AND ACTUATING CIRCUIT FOR MUSICAL INSTRUMENTS

Ralph L. Dodds, and Bradley J. Plunkett, both of Los Angeles, Calif., assignors to Warwick Electronics Inc., Chicago, Ill.

Division of Ser. No. 466,551, June 24, 1965, Pat. No. 3,439,569.
Filed Mar. 21, 1969, Ser. No. 828,047
Int. Cl. H03b *29/00*
U.S. Cl. 331—78 **5 Claims**



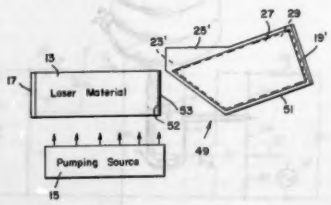
A noise generator circuit is disclosed herein having a transistor amplifier operated by a noise diode connected to its base electrode. The noise diode is operated in response to a selected one of a plurality of decoupling diodes arranged in a network with respect to a plurality of voicing oscillators. A collector resistor couples the decoupling diode network to respective ones of the voicing oscillators. The oscillators may be of the phase shift or the multivibrator type.

3,593,188

INTERNALLY MODULATED LASER

Thomas A. Nussmeier, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 19, 1968, Ser. No. 738,263
Int. Cl. H01s *3/12*
U.S. Cl. 331—94.5 **5 Claims**



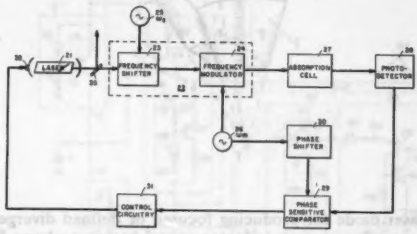
A laser beam is modulated by an internal modulator, which incorporates in a single element a polarizer and a retardation modulator. A modulating signal is applied across electrodes on the modulator as a variable electric field having a direction that is orthogonal to a direction of preferred polarization. The modulator is comprised of electro-optic material having a flat window surface and is placed in the regenerative path within the laser and positioned such that the normal of the window surface is at the Brewster angle with respect to the regenerative path passing through this surface. The orientation of the surface about the active axis determines the type of modulation present.

3,593,189

FREQUENCY STABILIZATION SYSTEM

Carl F. Buhrer, Oyster Bay, N.Y., assignor to General Telephone & Electronics Laboratories Incorporated

Filed Feb. 27, 1969, Ser. No. 802,874
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **11 Claims**



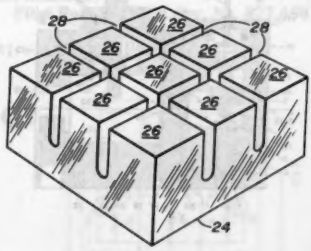
A system for stabilizing the output frequency of a laser that uses as a reference absorber a material which is different from the active medium of the laser being stabilized. The system employs a frequency shifter for shifting the output frequency of the laser to a specified frequency within the absorption spectrum of the reference absorber material.

3,593,190

ELECTRON BEAM PUMPED SEMICONDUCTOR LASER HAVING AN ARRAY OF MOSAIC ELEMENTS

Alan R. Reinberg, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 16, 1969, Ser. No. 816,667
Int. Cl. H01s *3/18*
U.S. Cl. 331—94.5 **12 Claims**



An electron beam pumped laser wherein the radiating crystal comprises a semiconductor wafer and a mosaic array of radiating elements. Each radiating element in the array emits radiation in a direction coinciding with the axis of the pumping electron beam. Stimulated emission transverse to the pumping electron direction is suppressed by dimension-

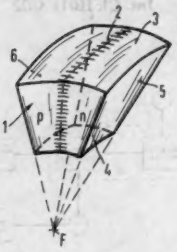
ing each radiating element to prevent gain in the transverse direction. The mosaic of radiating elements may be formed by etching or cutting slots in a semiconductor slice or by direct growth on the semiconductor slice.

3,593,191

ELECTRICALLY FOCUSSED LASER DIODE

Heinz Henker, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Sept. 24, 1969, Ser. No. 860,634
Claims priority, application Germany, Sept. 30, 1968, P 17 89 061.8
Int. Cl. H01s 3/18
U.S. Cl. 331—94.5 8 Claims



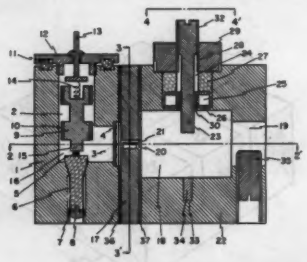
A laser diode for producing focused or defined divergent light comprises a semiconductor crystal having a planar PN junction and two parallel end faces extending perpendicular to the PN junction and conjointly forming a resonator for optical radiation. The end faces comprise portions of two confocal surfaces. The PN junction extends between the two confocal surfaces in a radial plane relative to the focal locus. One of the end faces is impermeable to optical radiation and the other of the end faces is a mirror partially permeable to optical radiation.

3,593,192

DOUBLE CAVITY TYPE SOLID STATE OSCILLATOR DEVICE

Shigemichi Nagano, and Tsutomu Itano, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed July 29, 1969, Ser. No. 845,741
Claims priority, application Japan, July 30, 1968, 43/54219
Int. Cl. H03b 7/14
U.S. Cl. 331—96 3 Claims



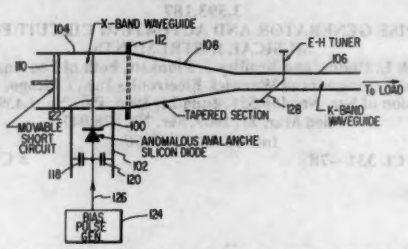
A double cavity type oscillator device is provided wherein a throttle window and iris are disposed between a main cavity having a built-in solid state oscillator element and an auxiliary cavity. The window electromagnetically couples the tunable auxiliary cavity with the main cavity. The iris, which is a low impedance capacitive iris, has a lateral width approximately equal to that of the end portion of the throttle window and to that of the auxiliary cavity, and a vertical dimension smaller than that of said throttle window.

3,593,193

HIGH POWER AVALANCHE DIODE MICROWAVE OSCILLATORS HAVING OUTPUT FREQUENCY ABOVE DIODE TRANSIT TIME FREQUENCY

Kern Ko-Nan Chang, Princeton; Shing-Gong Liu, Princeton, and John Joseph Risko, Cranbury, all of, N.J., assignors to RCA Corporation

Filed June 19, 1969, Ser. No. 834,805
Int. Cl. H03b 7/14
U.S. Cl. 331—96 11 Claims



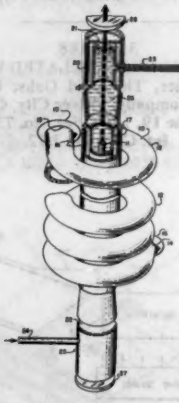
A wave tuning structure including a first portion in cooperative relationship with an anomalous silicon avalanche diode, a second portion coupled to the first portion for supporting oscillations at the transit time frequency of the diode, and a third portion coupled to at least one of the first and second portions for supporting oscillations at a given frequency significantly higher than the transit time frequency, serves to provide relatively high power at the given frequency to a load coupled to the third portion of the wave tuning structure, such as 17 watts at 24 gigahertz and 28 watts at 10.5 gigahertz for instance, in response to a bias pulse being applied to the diode. A significant output power is still obtained at frequencies exceeding 33 gigahertz.

3,593,194

LASER COOLANT AND ULTRAVIOLET FILTER

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; John R. Rasquin, 1003 Cardinal Ave., Madison, Ala., and Fred R. McDevitt, 1713 Dartmouth Ave., Melborne, Fla.

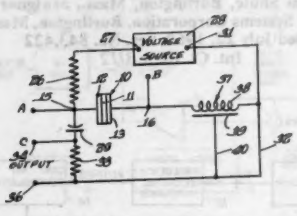
Filed Oct. 2, 1969, Ser. No. 863,276
Int. Cl. H01s 3/04, 3/09; G02l 5/24
U.S. Cl. 331—94.5 5 Claims



Ruby lasers are cooled and protected from detrimental ultraviolet radiation by means of a solution of copper sulfate in an alcohol solvent. The coolant-filter solution is disposed between the ruby crystal and the laser-actuating light source so as to absorb short-wavelength ultraviolet radiation, while allowing energy in the ruby pumping bands to pass through.

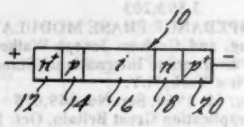
Circulation of the solution removes heat from the laser crystal and improves its operation.

3,593,195
OSCILLATOR CIRCUIT
Roy R. Shanks, Royal Oak, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.
Filed Oct. 16, 1968, Ser. No. 767,994
Int. Cl. H03b 7/14
U.S. Cl. 331—107 R 4 Claims



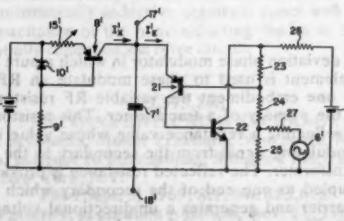
An oscillator circuit using a symmetrical threshold semiconductor device as the active component, a resistance-reactance circuit for generating exponential waveforms and a time delay line to control the operation of the semiconductor device and resistance-reactance circuit.

3,593,196
TYPE OF AVALANCHE DIODE
George I. Haddad, Ann Arbor, Mich., assignor to Omni Spectra, Inc., Farmington, Mich.
Filed Feb. 19, 1969, Ser. No. 800,532
Int. Cl. H03b 7/06
U.S. Cl. 331—107 R 4 Claims



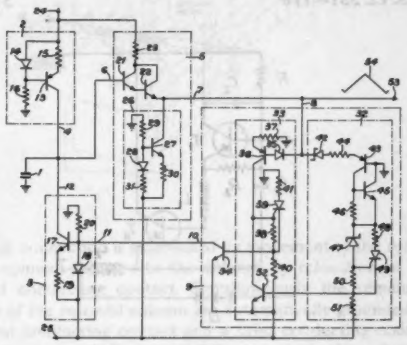
An avalanche diode, of the IMPATT diode type, which may be used as an oscillator, amplifier, or frequency converter and having a construction utilizing both N^+P and NP^+ junctions whereby improved power output and other operating characteristics can be attained.

3,593,197
RELAXATION OSCILLATOR
Ricardo A. Carreras, Plantation, Fla., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Apr. 14, 1969, Ser. No. 815,848
Int. Cl. H03k 3/26
U.S. Cl. 331—111 3 Claims



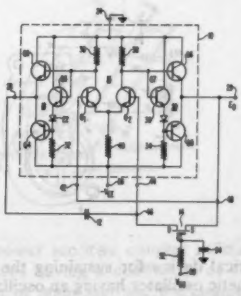
A relaxation oscillator is disclosed wherein a capacitor is periodically charged and discharged to generate an output signal across the capacitor. A three terminal semiconductor means such as a unijunction transistor, is used to provide a discharge path for the capacitor, the unijunction transistor discharging the capacitor whenever a sufficient voltage is accumulated on the capacitor to forward bias the discharge path. An AC modulating the bias voltage applied to the unijunction transistor, thereby the magnitude of voltage necessary to forward bias the discharge path is also modulated.

3,593,198
SOLID-STATE FREE RUNNING TRIANGLE WAVEFORM GENERATOR
Edmund A. Karcher, and Jack G. Paschal, both of North Palm Beach, Fla., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed Sept. 15, 1969, Ser. No. 858,018
Int. Cl. H03k 4/50, 4/06
U.S. Cl. 331—111 12 Claims



This is a free running triangular waveform generator circuit having a linear output. The circuit includes two constant current generators, one charging and the other discharging a capacitor, a buffer circuit which transmits a first and second voltage level across the capacitor without loading down the capacitor, and a switching circuit which is activated by the two transmitted voltage levels so as to switch one of the constant current generators on and off. The switching and buffering circuits have no capacitors and the charging capacitor is a very small value, thus making the circuit adaptable for integrated circuit fabrication.

3,593,199
VOLTAGE VARIABLE CLOCK OSCILLATOR
John C. Spann, Baltimore, and James R. Hudson, Poplar Point, both of, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Nov. 18, 1969, Ser. No. 877,650
Int. Cl. H03k 3/282
U.S. Cl. 331—111 10 Claims



A clock oscillator which can be used as a master clock in a digital system comprising an emitter coupled logic gate

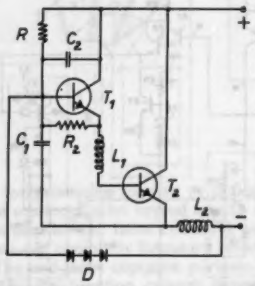
operated as a free running bistable device by means of a resistance-capacitance network coupled thereto and which is alternately charged and discharged at the desired output frequency and wherein the resistive element in the network is comprised of a metal oxide silicon field effect transistor (MOSFET) the drain-source resistance of which is selectively varied by means of a potential applied to the gate thereof from an externally controlled source for establishing a desired frequency of operation.

3,593,200

ELECTRONIC SWITCHING ARRANGEMENT FOR TIME KEEPING EQUIPMENT

Robert W. Reich, Via Noseda 8, CH-6977 Ruvigliana, Switzerland

Filed Feb. 18, 1969, Ser. No. 800,146
Claims priority, application Switzerland, Oct. 20, 1968, 15737/68
Int. Cl. H03b *5/36*
U.S. Cl. 331—116 **3 Claims**



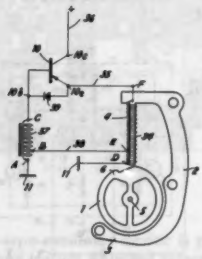
A self-exciting electronic circuit for driving the mechanical rate element of a time-keeping device including means to vary the width of the drive pulse to compensate for amplitude differences caused by temperature or voltage changes.

3,593,201

DEVICE FOR KEEPING UP OSCILLATIONS OF ELECTROMAGNETIC OSCILLATORS

Michel Emil Leon Havot, and Guy Gustave Lucien Dubot, both of Dieppe, France, assignors to Societe Anonyme: Reveils Bayard, Saint Nicolas D'Aliermont, Seine Maritime, France

Continuation of application Ser. No. 684,060, Nov. 17, 1967. This application Apr. 21, 1969, Ser. No. 818,038
Int. Cl. H03b *5/30*
U.S. Cl. 331—116 **16 Claims**



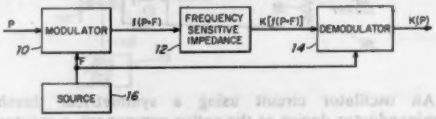
An electrical device for sustaining the oscillations of an electromagnetic oscillator having an oscillating wheel-shaped element capable of reciprocal movement is disclosed. A fixed frame cooperating with the wheel-shaped element is positioned in the same plane as the element and has a pair of coils associated therewith for causing motion to be imparted to the element. The coils are connected in an electrical circuit containing an electronic switch and an electrical source. The electronic switch includes a control transistor which avoids the need for frictional contacts. The function of said device depends on the magnetic remanence of a deformable magnetic circuit formed by the element and the frame to produce reading and driving signals.

3,593,202

AMPLITUDE CONTROL APPARATUS

Donald William Shute, Burlington, Mass., assignor to Space and Tactical Systems Corporation, Burlington, Mass.

Filed July 22, 1969, Ser. No. 843,422
Int. Cl. H03c *3/12*
U.S. Cl. 332 **2 Claims**



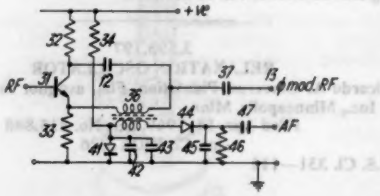
Frequency responsive amplitude control apparatus is disclosed including means for combining a first parameter with a second parameter to produce a third parameter, and means for varying impedance to the third parameter in response to the frequency of the third parameter introduced by the second parameter to produce a fourth parameter whose amplitude is a function of the frequency of the second parameter.

3,593,203

VARIABLE IMPEDANCE PHASE MODULATOR

Howard Gurnos King, and Graham Joseph Walker, both of London, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 11, 1969, Ser. No. 849,075
Claims priority, application Great Britain, Oct. 17, 1968, 49298/68
Int. Cl. H03c *3/12*
U.S. Cl. 332—29 R **6 Claims**

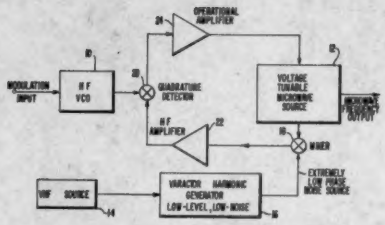


A wide deviation phase modulator in which a pure resistive variable element is used to phase modulate an RF carrier signal. In one embodiment the variable RF resistor is provided by the primary of a transformer. This resistor is provided by reflecting a resistance value whose value is varied by the modulating signal from the secondary to the primary of the transformer. The reflected resistance is provided by a diode coupled to one end of the secondary which rectifies the RF carrier and generates a unidirectional voltage in an RC circuit. The modulating AF signal is also supplied to the RC circuit. The combination of the unidirectional voltage and AF current produces a load impedance of varying value to the diode. This varying impedance is reflected through the transformer to the primary.

3,593,204
HIGH FREQUENCY VOLTAGE CONTROLLED OSCILLATOR

Daniel J. Healey, III, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 22, 1969, Ser. No. 826,979
Int. Cl. H03c 3/22
U.S. Cl. 332—30 V 10 Claims

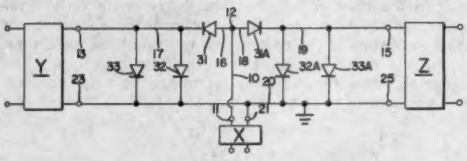


A high frequency voltage controlled oscillator incorporating a pair of varactor diodes in a bridge circuit forming the resonator section in a positive feedback circuit of a common base transistor oscillator.

3,593,205
SINGLE POLE N-THROW MICROWAVE SWITCH

Salvatore G. Coraccio, Carlisle, and Philip E. King, Acton, both of, Mass., assignors to Alpha Industries, Inc., Newton Upper Falls, Mass.

Filed May 5, 1969, Ser. No. 821,656
Int. Cl. H01p 1/10
U.S. Cl. 333—7 3 Claims



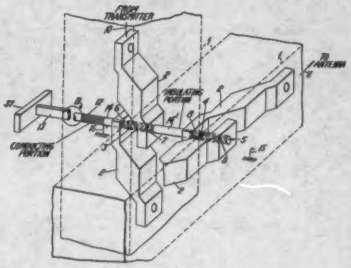
A single pole multithrow microwave switch includes a number of terminal pairs, an outer conductor defining a cavity normally maintained at a reference potential intercoupling reference terminals in each terminal pair. Each terminal pair also has a signal terminal. An inner conductor within the cavity intercouples one signal terminal with a common terminal within the cavity. The common terminal is connected to each signal terminal by a circuit containing serially connected and shunt-connector diodes. The shunt-connected diode is coupled to the common terminal by a serially connected unilaterally conducting device in each circuit. The serially connected and shunt-connected diodes in each circuit are polarized so that mutually exclusive conduction occurs upon application of a bias signal. Portions of the inner conductor within the cavity coact with the outer conductor to define substantially inductive transmission line segments. These substantially inductive segments coact with the effective capacitance of the nonconducting diodes to comprise a substantially reflectionless filter circuit.

3,593,206
ANTENNA SWITCHING EXCHANGE

Helmut Schimann, Mount Pritchard, New South Wales, Australia, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 5, 1969, Ser. No. 855,678
Claims priority, application Australia, Nov. 21, 1968, 46609
Int. Cl. H01p 1/10; H01g 3/24
U.S. Cl. 333—7 8 Claims

A switching matrix including an orthogonal array of $m \times n$ coaxial lines, where m equals the number of transmitters which may be simultaneously connected to the matrix and n is the number of antennas to each of which any one of the m transmitters may be connected. Each of the n rows is made up of m separated sections of a coaxial line center conductor connected electrically by first conducting contacts at each cross-point of the matrix. Each of the m columns is made up of n separated sections of a coaxial line center conductor connected electrically by second conducting contacts at each cross-point of the matrix. The first and second conducting contacts for each cross-point are a part of a common rod separated by segments of insulating material. A cross-point

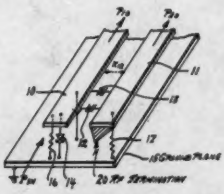


through connection is established by movement of the rod so as to connect the row to the column by relocation of the second conducting contact. Simultaneously the remaining length of the row and column are automatically grounded by the first conducting contact and a third conducting contact separated by insulating material from the second conducting contact to eliminate the presence of residual stubs in the matrix. A cam assembly to make and break the cross-point through connection is coupled to either all the rods of a column or all the rods of a row depending upon which has the lesser number of rods. A single motor drives the cam assembly.

3,593,207
MICROWAVE INTEGRATED POWER SENSITIVE COUPLER

James D. Woermbke, Tampa, Fla., and Herbert Warren Cooper, Hyattsville, Md., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Apr. 27, 1970, Ser. No. 32,316
Int. Cl. H01p 3/08, 5/14; H04b 3/04
U.S. Cl. 333—10 6 Claims



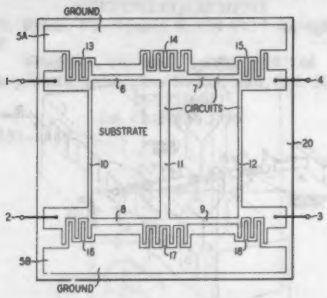
A microwave power sensitive coupler utilizing planar or strip line techniques having a coefficient of coupling, K_{12}, between the input or main arm and the coupled power dependent arm. Thus, the coupled power would remain substantially constant over large dynamic ranges of input power level.

3,593,208

MICROWAVE QUADRATURE COUPLER HAVING LUMPED-ELEMENT CAPACITORS

John I. Smith, Morris Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 17, 1969, Ser. No. 807,827
Int. Cl. H01p 5/14
U.S. Cl. 333—10 5 Claims



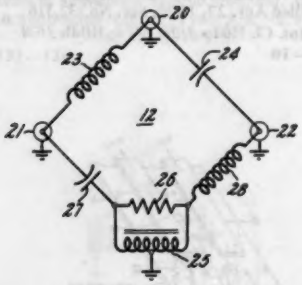
A microwave quadrature coupler constructed of a plurality of thin conductive strips on a substrate, preferably formed by photolithographic means. Each of these strips comprises a section of transmission line having a physical length less than one-quarter wavelength at the midband frequency. The ends of these lines are coupled to other circuit elements through lumped capacitors also formed of thin layers coplanar with the conductive strips on the same substrate.

3,593,209

HYBRID FILTER FOR TWO-WAY TRANSMISSION OVER A SINGLE LINE

Norman C. Gittinger, Schenectady, N.Y., assignor to General Electric Co.

Filed Dec. 29, 1969, Ser. No. 888,799
Int. Cl. H01p 5/12; H03h 7/04
U.S. Cl. 333—11 7 Claims



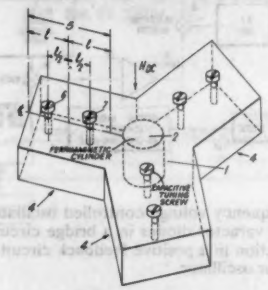
A hybrid filter is disclosed wherein the characteristics of a hybrid coupler and high and low pass filters are combined. Each port of the hybrid filter exhibits a constant input impedance that is independent of frequency. The hybrid filter provides a common, low pass and a high pass port, thus providing both frequency and power isolation between branches.

3,593,210

WAVEGUIDE JUNCTION CIRCULATOR WHEREIN ALL MODES IN EACH BRANCH ARM ARE EVANESCENT

Richard Finnie Skedd, Bishop's Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 19, 1969, Ser. No. 886,639
Claims priority, application Great Britain, Mar. 5, 1969, 11783/69
Int. Cl. H01p 1/32, 5/12
U.S. Cl. 333—1.1 5 Claims



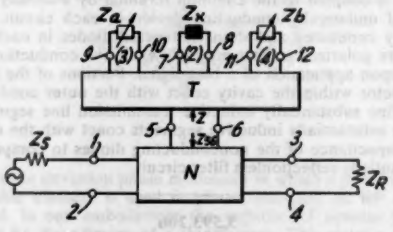
A waveguide junction circulator of the type having a resonant cavity loaded with ferrimagnetic material wherein the coupling ports consist of a length of waveguide having a cutoff frequency which is higher than the operating frequency and wherein said waveguide is tuned to the operating frequency by inserting therein, along the broad wall at predetermined lengths, screws whose capacitive reactance is equal to the conjugate of the imaginary characteristic impedance of the waveguide. In a preferred embodiment, the cutoff frequency of the rectangular waveguide is made tunable and the resulting passband variable by inserting in said waveguide, along the sidewalls, ferrimagnetic strips and subjecting said strips to a variable magnetic field.

3,593,211

ADJUSTABLE ATTENUATION EQUALIZER

Yasutoshi Ishizaki, and Nobuyoshi Yoshida, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed July 15, 1968, Ser. No. 745,047
Claims priority, application Japan, July 17, 1967, 42/45954
Int. Cl. H03h 7/22
U.S. Cl. 333—28 5 Claims



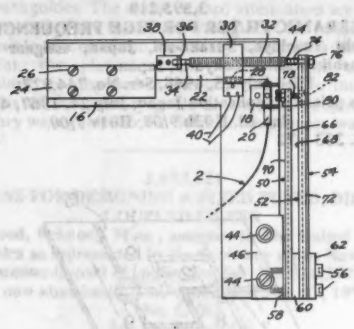
An adjustable attenuation equalizer having multiple independently adjustable loss characteristics in either distinctly separated or overlapping frequency ranges comprises two or more adjustable impedance elements in a single equalizing network. The equalizer of the invention also includes fixed impedance elements, the number of which is equal to the number of transformer networks in the equalizing network.

3,593,212

TEMPERATURE-COMPENSATED DELAY LINE

Robert E. Lindemann, St. James, N.Y., assignor to Digital Devices, Inc., Syosset, N.Y.

Filed Apr. 14, 1969, Ser. No. 815,741
Int. Cl. H03h 9/30
U.S. Cl. 333—30 9 Claims



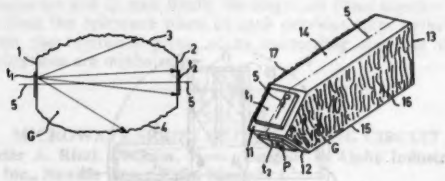
A temperature-compensated delay line wherein one of the input and output transducers thereof is movable, and including means for moving the transducer according to changes in ambient temperature to maintain the time delay at a predetermined value.

3,593,213

ULTRASONIC DELAY LINE AND METHOD OF MANUFACTURING AN ULTRASONIC DELAY LINE

Cornelis Franx, and Manfred Franz Karl Gammel, both of Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1967, Ser. No. 688,482
Claims priority, application Netherlands, Dec. 28, 1966, 6618228
Int. Cl. H03h 9/30
U.S. Cl. 333—30 12 Claims



An ultrasonic delay line comprising a glass body having first and second surfaces on which an input transducer and an output transducer are mounted. A third surface of the body perpendicular to the first two reflects energy towards a fourth parallel surface opposite thereto and fluted to damp the energy received. The transducers are polarized parallel to their respective contact surfaces and parallel to the third surface. The main energy propagation path in the body is parallel to the third surface.

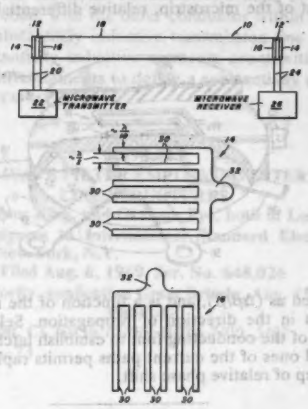
3,593,214

HIGH IMPEDANCE TRANSDUCER

Herbert Warren Cooper, Hyattsville, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 29, 1969, Ser. No. 820,111
Int. Cl. H03h 9/30
U.S. Cl. 333—30 6 Claims

Various electrode structures are disclosed for reducing the capacitance between the electrodes of electromechanical transducers of the piezoelectric type. The electrode structures used thereby increase the impedance of such transducers so that a low loss match can be effected between the transducers and associated electromagnetic circuitry.

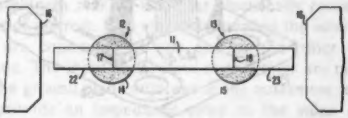


3,593,215

FIELD SHAPING FOR MAGNETOELASTIC DELAY LINES

Robert A. Moore, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 1, 1969, Ser. No. 811,710
Int. Cl. H03h 9/30
U.S. Cl. 333—30 9 Claims



Desired magnetic field shaping in a delay line for controlling its dispersive characteristics is achieved by placement of a ferrite material in intimate contact with a high Q magnetic insulating (YIG) material. Low loss is achieved by maintaining the RF coupling circuit in intimate contact with the crystal end and having the dispersive characteristic of the line controlled by ferrite magnetic field shaping material and the RF circuit interpenetrate. Dispersive characteristics of magnetoelastic delay lines are thus controlled through field shaping.

3,593,216

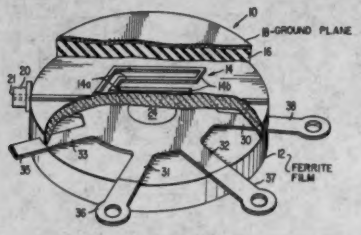
RECIPROCAL FERRITE FILM PHASE SHIFTER HAVING DIGITALLY CONTROLLED RELATIVE PHASE SHIFT STEPS

Daniel C. Buck, Hanover, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 2, 1969, Ser. No. 821,422
Int. Cl. H01p 1/18
U.S. Cl. 333—31 R 10 Claims

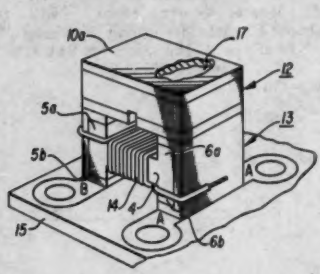
The phase shifter comprises a ferrite film structured to define a multiple toroid configuration and having deposited on one surface thereof a microwave transmission line defining the direction of propagation of microwave energy. Flux driving means are digitally controlled for selectively driving the film to remanent conditions of magnetization of predetermined orientations relative to the direction of microwave propagation. In a preferred embodiment, the flux driving means includes a conducting film deposited between two layers of the ferrite film, which layers are integrally formed about the boundaries of the conducting film to define the

multiple toroid configuration. Energization of selected latching current paths defined by the film provides for the selective flux driving of the film. Where β is the propagation constant of the microstrip, relative differential phase shift is



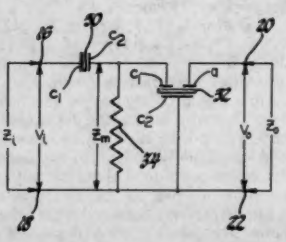
expressed as $(\Delta\beta/\beta)$, and is a function of the remanent field strength in the direction of propagation. Selective current pulsing of the conducting film to establish latching current in selected ones of the current paths permits rapid switching of each step of relative phase shift.

3,593,217
SUBMINIATURE TUNABLE CIRCUITS IN MODULAR TERM AND METHOD FOR MAKING SAME
Roger L. Weber, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Oct. 27, 1967, Ser. No. 678,619
Int. Cl. H03h *3/00, 5/06;* **H01j** *15/02*
U.S. Cl. 333—70 **14 Claims**



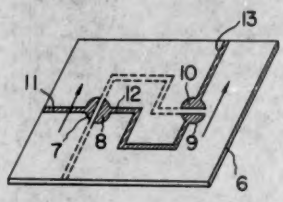
Disclosed is a subminiature tunable circuit in modular form and the method of making the modular circuit. A capacitor is mounted on an inductor to form a modular tunable circuit. By appropriate connections, either series or parallel reactive circuits are formed with intermediate tap connections, when desired. The circuit is tuned by changing the value of the capacitor by air abrasion techniques.

3,593,218
PIEZOELECTRIC FILTER NETWORK
Paul W. Wood, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 5, 1970, Ser. No. 16,821
Int. Cl. H03h *9/00, 9/18;* **H01v** *7/00*
U.S. Cl. 333—72 **5 Claims**



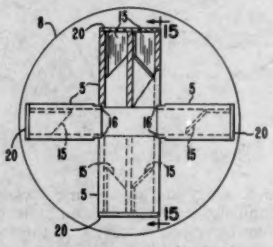
A plurality of piezoelectric disc resonators are connected to form various filter networks each exhibiting a composite frequency response curve having the desirable selectivity characteristics of the individual frequency response curves of he several resonators. The selectivity of the composite frequency response curves is sufficient to permit the utilization of each of the filter networks as an IF filter in a conventional superheterodyne radio receiver.

3,593,219
CERAMIC FILTER FOR HIGH FREQUENCIES
Hidetoshi Tsuchiya, Suzaka-shi, Japan, assignor to Toko Kabushiki Kaisha, Tokyo-to, Japan
Filed July 15, 1968, Ser. No. 744,927
Claims priority, application Japan, July 24, 1967, 42/47532
Int. Cl. H03h *9/04;* **H01v** *7/00*
U.S. Cl. 333—72 **8 Claims**



At least two filter elements one having a steeply peaked and narrow-band characteristic and one having a wide-band and gently sloping skirt characteristic are formed and electrically connected on a single piezoelectric ceramic plate to form a ceramic filter for high frequencies of 5 MHz. and higher in which thickness shear vibration is utilized, and which exhibits low spurious response of suitable bandwidth and a steep cutoff characteristic.

3,593,220
HIGH POWER MICROWAVE LOW-PASS FILTER OF THE LEAKY WALL TYPE
John P. Rooney, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.
Filed July 15, 1968, Ser. No. 744,806
Int. Cl. H01p *1/16, 1/22;* **H03b** *7/10*
U.S. Cl. 333—73 **10 Claims**



A high power microwave low-pass filter of the "leaky wall" type is disclosed. The filter employed in the output circuit of the high power microwave source such as a klystron, magnetron, or the like between the source and the load to suppress the harmonic output from the microwave source. The microwave filter comprises a section of main waveguide which is typically rectangular provided with flanges on its opposite ends for connection to the source and the load, respectively. An array of secondary waveguides, which are dimensioned to be below cutoff for the fundamental frequency of the microwave energy to be passed by the filter are coupled through the walls of the primary waveguide to the microwave energy in the primary guide. The secondary waveguides are provided with resistive card attenuators for absorbing the microwave harmonic energy coupled from the primary waveguide to the attenuators via the secondary

waveguides. The secondary waveguides are rectangular hollow waveguides having at ;east nearly equal height and width dimensions such that the seo secondary waveguides will support cross polarized microwave energy in the second harmonic range of the primary waveguide whereby attenuation of the harmonic content of the microwave energy in the primary waveguide is enhanced. The wl walls of the primary guide are defined by the inner ends of the secondary rectangular waveguides. The resistive card attenuators are disposed on a diagonal of the secondary waveguides for coupling to all the possible modes of the secondary waveguides. In one embodiment, the planes of the walls of the secondary waveguides are disposed at substantially 45° to the longitudinal axis of the primary guide to enhance coupling of the secondary waveguides to the fields in the primary waveguide.

3,593,221

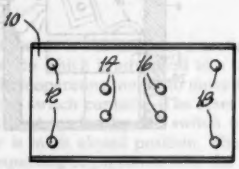
MEANS FOR DESIGNING A FIXED TUNED, DIRECT-COUPLED FILTER

John Reed, Belmont, Mass., assignor to The United States of America as represented by the Secretary of the Navy

Continuation-in-part of application Ser. No. 614,377, Feb. 2, 1967, now abandoned. This application Feb. 17, 1970, Ser. No. 12,003

Int. Cl. H03n *7/10*

U.S. Cl. 333—73 W 1 Claim



Means for precise design of a direct-coupled resonant filter without the use of adjustable tuning devices. The filter is of the type using a series of reactive obstacles within a waveguide (or transmission and, finally, each obstacle and its associated waveguide section forming a quarter-wave transformer stage. The overall design is approximately calculated on paper; each quarter-wave transformer stage is resonated by charting the effect of moving the positions of the obstacles and thus determining the precise positioning for the desired frequency and Q; and, finally the stages are fitted together by making the reference plane of each previous stage coincide with the reference plane of its succeeding stage so that reflections are minimized.

3,593,222

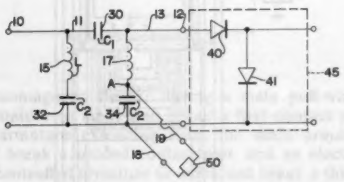
MICROWAVE SERIES SWITCH BIASING CIRCUIT

Peter A. Rizzi, Dedham, Mass., assignor to Alpha Industries Inc., Newton Upper Falls, Mass.

Filed May 21, 1969, Ser. No. 826,510

Int. Cl. H01p *1/20, 1/10*

U.S. Cl. 333—73 R 9 Claims



A series biasing circuit includes a three terminal filter circuit within an outer conductor defining a cavity. The filter circuit has two signal terminals extending through and insulated from the wall of the cavity and common terminals connected to the cavity. A conducting wire extends through and is insulated from the outer conductor and into the cavity and connects to the filter circuit at a point which is capacitively insulated from the outer conductor. Portions of the inner conductors coact with the outer conductor within the cavity to define substantially inductive transmission line segments. These substantially inductive segments coact with substantially capacitive elements to define a substantially reflectionless filter circuit.

3,593,223

ELECTRIC WAVE FILTER EMPLOYING INTERDIGITAL LINE STRUCTURES

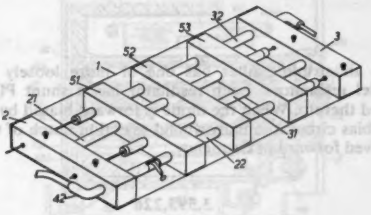
Howard Gurnos King, and Graham Pye, both of London, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 6, 1969, Ser. No. 848,026

Claims priority, application Great Britain, Aug. 15, 1968, 39008/68

Int. Cl. H03h *13/00;* H01p *7/00, 5/02*

U.S. Cl. 333—73 10 Claims



Interdigital electric wave filters are proposed which use mechanical structures having dimensions of less than one-quarter wavelength making the filter electrically resonant at frequencies of interest. Rod elements forming the interdigital structures are connected at one end or the other to the ground plane. The input and output connections are made to points on the ground plane adjacent to the outermost rod elements to provide an impedance close to the value of the characteristic impedance of the coupling cable.

3,593,224

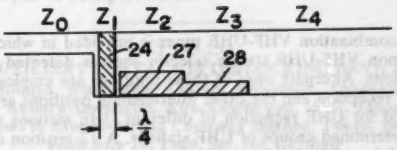
MICROWAVE TUBE TRANSFORMER-WINDOW ASSEMBLY HAVING A WINDOW THICKNESS EQUIVALENT TO ONE-QUARTER WAVELENGTH AND METALLIC STEP MEMBERS TO TRANSFORM IMPEDANCE

Robert E. Eggers, San Jose, and Karl J. Heintz, Palo Alto, both of, Calif., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed Feb. 4, 1969, Ser. No. 796,463

Int. Cl. H01p *1/08, 5/08;* H03m *13/00*

U.S. Cl. 333—98 6 Claims



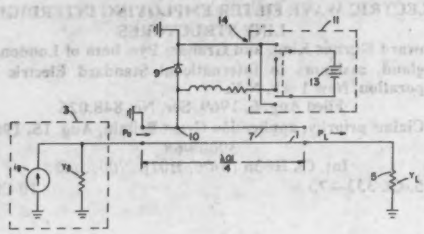
A microwave tube transformer-window is described utilizing a waveguide step transformer with a solid block window one-quarter wavelength long and producing the same impedance as the replaced step.

3,593,225

L-BAND SWITCHABLE NARROW BANDSTOP FILTER

Reed E. Fisher, Parsippany, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Sept. 29, 1969, Ser. No. 861,760
Int. Cl. H03h 13/00; H01p 7/02, 3/08
U.S. Cl. 333—73 S 3 Claims



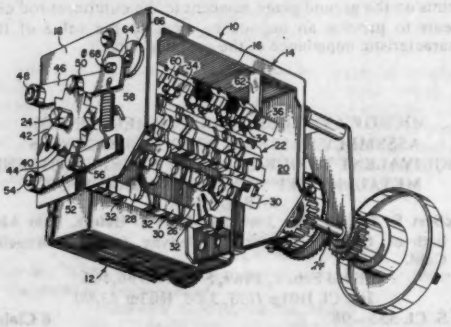
An air stripline filter has one or more loosely coupled parallel resonators. Each resonator has a shunt PIN diode tapped thereto. When the diode is forward biased by a reversible bias circuit the narrowband rejection notch of the filter is moved forward in frequency.

3,593,226

COMBINED VHF-UHF TUNER

Morton Weigel, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Apr. 14, 1969, Ser. No. 815,773
Int. Cl. H03j 5/20
U.S. Cl. 334—50 8 Claims



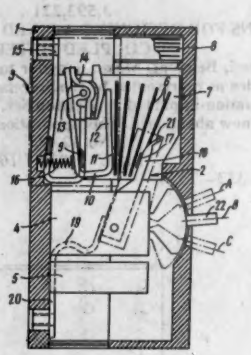
A combination VHF-UHF tuner is provided in which the common VHF-UHF station selector shaft is detented in 24 positions. Alternate ones of these positions are employed in VHF reception and the other intermediate positions are employed for UHF reception of different UHF stations within predetermined groups of UHF stations. A 12-position detent wheel is employed in conjunction with a pair of follower arms arranged so that 24 detent positions are provided by alternate engagement of the arms in the notches of the detent wheel. Movement of one of the arms is used to actuate a 40 megacycle tuning stick so that it is operatively connected into the VHF portion of the tuner in each of the UHF positions.

3,593,227

AUTOMATIC ELECTRODYNAMIC BLOWOFF BREAKER WITH STATIONARY CONTACT FORM OF TWO SERIES WOUND U-SHAPED MEMBERS

Gennady Fedosievich Mitskevich, Moskovsky pr., 193, kv. 7.; Anatoly Mikhailovich Bela-Belov, ulitsa Krasnoi Zvezdy, 4, kv. 1; Vladislav Yakovlevich Guschin, Moskovsky pr., 96, kv. 31; Viktor Izrailevich Rakhlis, Moskovsky pr., 228, kv. 54.; Viktor Revoldovich Oktyabrev, Moskovsky pr., 96, kv. 143; Jury Nikolaevich Vorontsov, ulitsa Prospektnaya, 28; Oleg Ivanovich Artsybashev, Korsikovsky per., 73, and Fedor Andreevich Vakhomchik, ulitsa Motornaya, 5-b, kv. 3., all of Kharkov, U.S.S.R.

Filed Feb. 28, 1968, Ser. No. 709,100
Int. Cl. H01h 77/10
U.S. Cl. 335—16 9 Claims



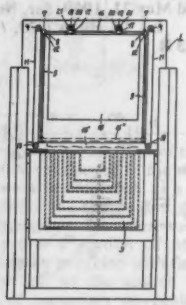
An automatic breaker, each pole of which comprises a movable and stationary system of contacts, characterized in that the stationary contact system is constituted as a series-wound coil having at least one turn and serving as an electrodynamic current limiter. The coil is composed of a stationary and movable element, the movable element of the coil serving as a stationary contact.

3,593,228

DEVICE FOR SELECTING AND OPERATING CONTACT SCREENS IN A PHOTOMECHANICAL (PROCESS) CAMERA

Yoshio Miyauchi, Hikone, Japan, assignor to Dainippon Screen Mfg., Ltd., Kyoto, Japan

Filed Nov. 18, 1968, Ser. No. 776,620
Claims priority, application Japan, Nov. 18, 1967, 42/74,060
Int. Cl. G03b 27/00
U.S. Cl. 355—18 4 Claims



Device for Selecting and Positioning Contact Screens in a Photomechanical (Process) Camera wherein the screens are received in the upper section of the rear case of the camera

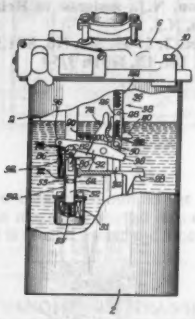
and selectively positioned along an axis vertically displaced from the optical axis.

3,593,229

RESETTING MEANS FOR SECTIONALIZING SWITCH

Kazuo Henry Date, S. Milwaukee, Wis., assignor to McGraw-Edision Company, Elgin, Ill.

Filed Dec. 5, 1969, Ser. No. 882,499
Int. Cl. H01h 75/04
U.S. Cl. 335—29 14 Claims



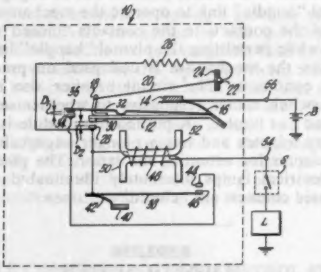
A quick reset means is disclosed for a sectionalizing switch having a trip device which is advanced to a tripping position to cause the switch operating means to move to an open position and open the switch contacts. The reset means includes resilient means held loaded by the switch operating means when the latter is in its closed position. The reset means is movable into impacting engagement with the trip mechanism due to the force supplied by the resilient means. Thus, when the operating means is tripped and moved to its open position, the reset means is released and impacts the trip mechanism to quickly reset the trip mechanism.

3,593,230

LOAD INDEPENDENT THERMO-MAGNETIC FLASHER

Hemming G. Sliberg, Summit, N.J., assignor to Wagner Electric Corporation

Filed Oct. 27, 1969, Ser. No. 869,551
Int. Cl. H01h 61/06
U.S. Cl. 335—141 9 Claims



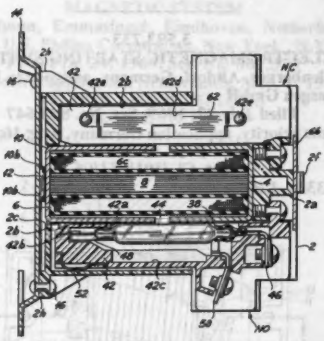
A thermomagnetic flasher having a main pull-wire controlled armature to make and break a first contact pair, an auxiliary armature extending from the main armature to make and break a second contact pair, and an electromagnetically-controlled armature to make and break a third contact pair. During heating of the pull wire, the contact pairs close in second-first-third order, and during cooling of the pull wire, the contact pairs open in first-second-third order. The second and third contact pairs control a load current path paralleling the path controlled by the first contact pair. In the foregoing cycle, during heating of the pull wire, the path through the first contact pair closes first to energize the load, and the path through the second and third contact pairs closes second. During cooling of the pull wire, the path through the first contact pair opens first, but the load is still energized by the path through the second and third contact pairs, which opens second.

3,593,231

CONVERTIBLE SEALED REED SWITCH RELAY

Lawrence E. Van Horn, Waukesha, and Edward Wayne Hart, Milwaukee, both of, Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Dec. 14, 1966, Ser. No. 601,693
Int. Cl. H01h 1/66, 9/08
U.S. Cl. 335—152 15 Claims



1. A convertible electromagnetic switching device comprising, in combination; a hollow insulating enclosing case; an electromagnet mounted within said case, said electromagnet including a coil having an axial opening therethrough, a magnetizable core extending through said axial opening, and a pair of magnetizable pole pieces overlapping the respective ends of said coil and said core and extending toward each other along opposite external sides of said coil; at least one opening in said case adapted to receive at least one magnetically operable-sealed switch means therein; at least one of said switch means removably inserted into said opening in said case to extend alongside of said magnetizable pole pieces at the opposite external sides of said coil of said electromagnet within said case to be operated upon energization of said electromagnet; and wherein said switch means inserted into said opening in said case comprises a magnetically operable-sealed reed switch unit mounted within an insulating housing to form a switch module, said housing having an external shape to be received by said opening in said case, a pair of wiring terminals secured to said housing to be accessible to the exterior of said enclosing case when said switch module is inserted into said opening therein, and means connecting the current carrying members of said reed switch unit to said pair of wiring terminals.

3,593,232

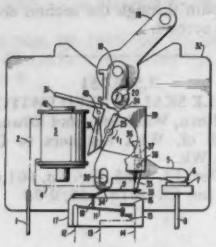
AUXILIARY CONTACT INTERLOCKING DEVICE

Eiji Shibuya, Iruma-gun; Takeshi Konomoto, Fukuoka-cho, and Akihiro Sawamura, Kita-Adachi-gun, all of, Japan, assignors to Sanken-Airpax Company Limited, Tokyo, Japan

Filed July 29, 1969, Ser. No. 845,840
Int. Cl. H01h 9/24
U.S. Cl. 335—160 3 Claims

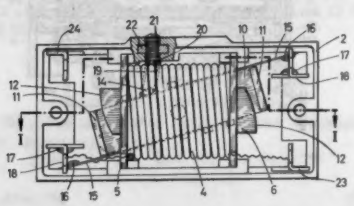
Disclosed is a circuit protector having an interlock arrangement for operating an auxiliary switch when the protector is tripped by an overcurrent but not when the main contacts are manually opened. An interlock plate receives the stepped end of a support arm and normally holds the auxilia-

ry switch in a first condition. Overcurrent tripping rotates the support arm to free the interlock plate, allowing the auxiliary



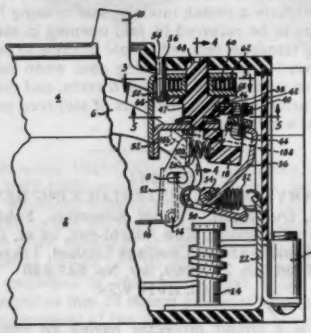
switch to operate. The auxiliary switch is reset through the interlock plate when the main contacts are manually closed.

3,593,233
ELECTROMAGNETIC STARTING SWITCH
Jakob Ellenberger, Altdorf, Germany, assignor to Ellenberger & Poensgen GmbH
Filed July 22, 1969, Ser. No. 843,647
Claims priority, application Germany, Aug. 16, 1968, P 17 63 823
Int. Cl. H01h *51/06*
U.S. Cl. 335—125 **3 Claims**



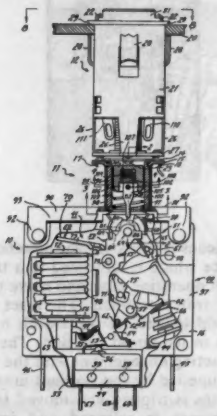
A starting switch for a single-phase induction motor has an armature rotatable by an electromagnet to close two pairs of electrical contacts connectable to the starting winding of the motor. The armature is balanced about its axis of rotation.

3,593,234
TRIP ADJUSTMENT MEANS FOR INSTANTANEOUS TRIP CIRCUIT BREAKER
Allan P. Charbonneau, Wauwatosa, and Howard W. Thom, Elm Grove, both of, Wis., assignors to Cutter-Hammer, Inc., Milwaukee, Wis.
Filed Feb. 9, 1970, Ser. No. 9,565
Int. Cl. H01h *71/74*
U.S. Cl. 335—176 **7 Claims**



An externally accessible adjustment cam for varying the armature gap of a magnetic trip circuit breaker is spring biased to the lowest setting through a lost motion connection with a disc to which a torsion spring is operatively attached. The cam may be rotated to any one of a plurality of higher settings, driving with it the spring biased disc. A pin is inserted through an opening in the circuit breaker case to engage and rotatably fix the disc at the chosen position to set the upper limit for the cam while the latter may be rotated backward through the lost motion connection to a somewhat lower setting if desired.

3,593,235
LINEARLY OPERATED CIRCUIT BREAKER
Ronald Nicol, Trenton, N.J., assignor to Heinemann Electric Company, Trenton, N.J.
Filed Dec. 2, 1969, Ser. No. 881,502
Int. Cl. H01h *3/54*
U.S. Cl. 335—186 **18 Claims**

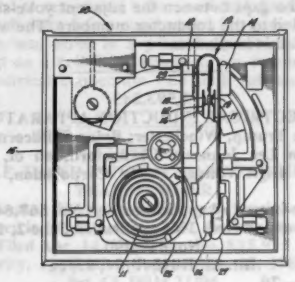


A circuit breaker including a case, a pair of contacts enclosed by the case and a collapsible linkage mechanism to move one of the contacts between contacts "closed" and "open" positions, the mechanism including a pivotal "handle" link. The circuit breaker also includes electrical means for sensing predetermined electrical conditions and collapsing said mechanism to electrically trip "open" said contacts at such time. A unitary adapter is secured to the case and includes an actuator movable generally linearly into engagement with the pivotal "handle" link and automatically retracted back to a neutral position out of engagement with the pivotal "handle" link to operate the mechanism for moving one of the contacts to the contacts "closed" or "open" positions while permitting the pivotal "handle" link to freely move when the mechanism is collapsed on predetermined electrical conditions. The circuit breaker also includes an auxiliary switch means responsive to whether said contacts are "closed" or "open." A pushbutton module is secured to the unitary adapter and has a plunger engageable with the unitary adapter for actuating the latter. The pushbutton includes electrical lamps alternately illuminated to indicate whether said contacts are "closed" or "open."

3,593,236
MAGNETIC SWITCH
Roland D. Beck, La Crescenta, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Continuation-in-part of application Ser. No. 617,191, Feb. 20, 1967, now abandoned. This application Mar. 23, 1970, Ser. No. 21,606
Int. Cl. H01h *1/66, 5/02, 9/00*
U.S. Cl. 335—205 **19 Claims**

A set of switch points are enclosed within a glass structure and include an armature that is magnetically movable to effect different connection arrangements of the switch points. A first magnet when acting alone attracts the armature to provide a first connective arrangement. A second magnet carried by a heat responsive bimetal is movable thereby to a

position where its attractive influence on the armature overcomes that of the first magnet and transfers the points to a different connective arrangement. An alternative embodiment has the two magnets mounted for unitary movement, that is, as the one magnet is moved into attractive influence, the other magnet is moved away, and vice versa.



3,593,237
GALVANOMETRIC TRANSDUCER

Moisei Abramovitch Lekhtman, ulitsa Pugacheva, 53, kv. 60; Azik Iosifovich Perelberg, ulitsa Pushkina, 16, kv. 12, and Tamara Yakovlevna Shralfeld, ulitsa Florilor, 8/4, kv. 40, all of Kishinev, U.S.S.R.

Filed Dec. 24, 1969, Ser. No. 888,007
Int. Cl. H01f 7/08
U.S. Cl. 335—222 **1 Claim**

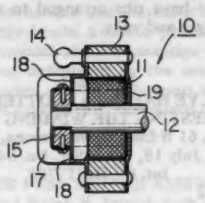
A galvanometric transducer having a movable system and an element operatively connected to this movable system, this element being positioned in a magnetic field and adapted to respond to variations of this magnetic field; this element has at least two current supply leads and at least two other leads, positioned in the magnetic field; in accordance with the herein disclosed invention, these at least two other leads extend parallel to he the vertical axis of the movable system and are fixedly attached to the movable system, at least two current supply leads of the element being positioned to one side of the horizontal central line of the movable system.

3,593,238
THROTTLE CONTROL UNIT FOR CONTROL SYSTEM OF AUTOMOTIVE AUTOMATIC TRANSMISSION

Yoichi Mori, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 29, 1969, Ser. No. 872,313
Claims priority, application Japan, Oct. 30, 1968, 43-78,833
Int. Cl. H01f 7/08
U.S. Cl. 335—229 **3 Claims**

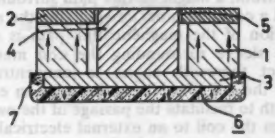
A device for controlling the throttle valve in an automotive engine having a rotary permanent magnet carried on the shaft of the throttle valve, a stationary electric magnet producing a longitudinal magnetic field and connected by a pin with an accelerator pedal, an electromagnet having a coil for producing a lateral magnetic field, a support for connecting the permanent magnet with the electromagnet, another magnet disposed opposite to the permanent magnet and rotatably engaged with the shaft. This device serves to open and close the throttle valve in the engine in response to an electric signal.



3,593,239
MAGNETIC SYSTEM

Wytze Hofman, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1969, Ser. No. 801,375
Claims priority, application Netherlands, Mar. 1, 1968, Oct. 16, 1968, 6802907;6814825
Int. Cl. H01f 7/00
U.S. Cl. 335—231 **5 Claims**

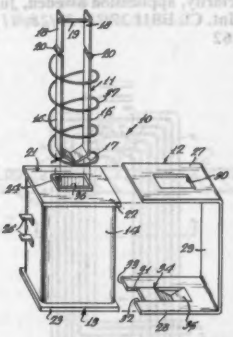


A magnetic system comprising an annular, axially magnetized, permanent main magnet, engaging on either end a soft iron plate; at the center of the main magnet and between the plates a soft iron core is arranged so as to be surrounded, with an airgap formed by one plate and said core, while on at least one of the plates an auxiliary magnet is provided which is magnetized mainly in the opposite direction of stray external magnetic flux.

3,593,240
SOLENOID STRUCTURE HAVING SINGLE SHEET METAL PLUNGER AND/OR YOKE

Frank S. Garczynski, St. Joseph, Mich., assignor to Whirlpool Corporation

Filed Mar. 10, 1969, Ser. No. 805,472
Int. Cl. H01f 7/12
U.S. Cl. 335—249 **7 Claims**



An electrical solenoid structure of extremely simple and economical construction. The plunger is stamped from sheet metal and includes an attaching portion unitary therewith.

The inner end of the plunger defines a bight portion and the yoke includes a complementary formed portion to provide high magnetic pull as a result of the reduced magnetic gap. The plunger may have ribs arranged to reduce the airgap between the plunger and yoke.

3,593,241

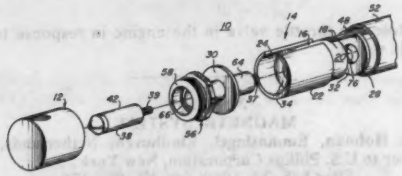
SOLENOID VALVE HAVING A SLOTTED FLUX SLEEVE FOR NESTING THE WINDING LEADS

Alfred J. Ludwig, 61 B Linn Drive, Verona, N.J.

Filed July 18, 1969, Ser. No. 842,909

Int. Cl. H01f 7/08

U.S. Cl. 335—262 **20 Claims**



An electromagnetically operated device is disclosed, the purpose of which is to selectively displace an armature between first and second positions. The solenoid-type device includes a coil member having a pair of energizing leads extending therefrom, a magnetic flux path surrounding the coil member, and a cover member surrounding the magnetic flux path. A portion of the magnetic flux path is defined by a magnetizable sleeve surrounding the coil member and in direct contact therewith so as to concentrate the flux generated by the coil. The sleeve includes an elongated gap along its length to facilitate the passage of the pair of energizing leads from the coil to an external electrical source. The cover member is constructed of nonmagnetizable material such as nylon, whereby the cover remains relatively cool and at the same time does not attract extraneous metallic particles. Although the electromagnetically operated device of the instant invention was particularly designed for alternately opening and closing a valved fluid path, a special adapting member makes the electromagnetically operated unit applicable to a variety of other applications which might necessitate the utilization of a selectively displacable member. A unique assembling procedure makes the entire unit easily removable from its functional environment.

3,593,242

LIQUID COOLED MAGNET COIL FOR PARTICLE ACCELERATION

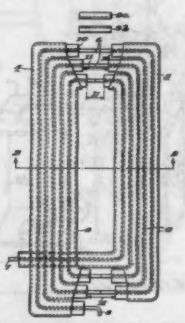
Arne Andersson, Vasteras; Hans Klein, Vasteras; Ove Tjernstrom, Irsta, and Carl Ronnevig, Vasteras, all of, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed July 11, 1968, Ser. No. 744,126

Claims priority, application Sweden, July 12, 1967,

Int. Cl. H01f 27/10, 27/28, 41/04

U.S. Cl. 336—62 **3 Claims**



A magnet coil for a particle accelerator is formed of a plurality of turns of a conductor each composed of two yoke-shaped parts of conducting material containing a central metallic tube. The tube extends from each end of the parts. The parts are so positioned that the projecting tubes engage each other, where they are welded together. The inside tube is then tested. Conducting members are then placed around the tube in the gaps between the adjacent yoke-shaped parts and are welded to the conductor members. The whole unit is then embodied in insulation.

3,593,243

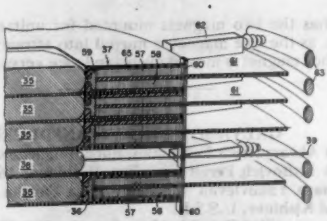
ELECTRICAL INDUCTION APPARATUS

John George Trump, Winchester; Brian Skillicorn, Topsfield, and Bryon Lee Johnson, Chelmsford, all of, Mass., assignors to High Voltage Power Corporation, Burlington, Mass.

Continuation-in-part of application Ser. No. 567,641, July 25, 1966, now abandoned. This application June 2, 1969, Ser. No. 840,090

Int. Cl. H01f 15/04, 15/14

U.S. Cl. 336—70 **12 Claims**



An electrical induction apparatus, adaptable for use as a transformer or a reactor which contains a magnetic circuit and an electrical circuit. The active portions of the magnetic circuit are formed of electrically isolated segments, each segment being electrically connected to a distinct portion of the electrical circuit such that when a voltage is impressed on the electrical circuit a systematic and uniform progression of voltage is imposed on the magnetic circuit. The electrical isolation appearing between each segment of the magnetic circuit is coated with a material adapted to establish electric field boundaries between the segments and prevent the creation of high electrical stress points while also preventing excessive eddy current loses.

3,593,244

ADJUSTABLE POT CORE COIL FOR PRINTED CIRCUITS

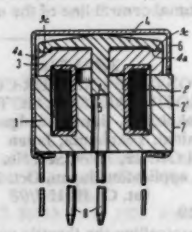
Gerhard Meindl, and Gerhard Winter, both of Deutscher, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Nov. 5, 1969, Ser. No. 874,291

Claims priority, application Germany, Nov. 26, 1968, P 18 11 045.7

Int. Cl. H01f 21/06

U.S. Cl. 336—83 **10 Claims**



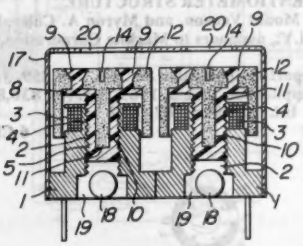
An adjustable two-part pot core coil, in which the inductance is adjustable by relative rotation of the two core halves about an axis of rotation with respect to which the pot components are concentric, the pot core halves being con-

structed to operatively receive the coil therein and having aligned central bores in which extends a centering pin carried by a centering disc disposed adjacent the upper core half, the bottom half of said core having an outwardly extending projection thereon adapted to extend into a recess in a resilient yoke arranged to retain said halves and said disc in operative positions, such yoke being constructed for noninterchangeable insertion into holes in a printed circuit plate, the coil being wound on a coil form which carries terminal pins for effecting electrical connection with such coil and a printed circuit plate.

3,593,245
DOUBLE-TUNED INTERMEDIATE-FREQUENCY TRANSFORMER

Kazutomo Iwata, Neyagawa-shi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 14, 1969, Ser. No. 815,915
Claims priority, application Japan, Apr. 18, 1968, 43/32631
Int. Cl. H01f *21/06*
U.S. Cl. 336—83 **1 Claim**

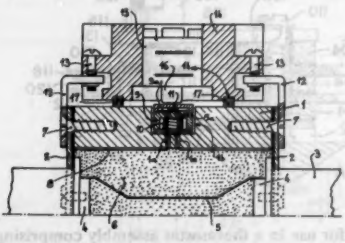


A double-tuned intermediate-frequency transformer having a structure wherein two single-tuned intermediate-frequency transformers employing cap-type cores provided with center cores therein are arranged adjacent to each other being covered with one shielding case, and being adapted to a free choice of the degree of coupling between the respective coils of the two single-tuned intermediate-frequency transformers laid adjacent to each other through adoption of the cap-type cores each having a suitable sleeve length relative to the length of its center core.

3,593,246
FUSE CARTRIDGE DEVICES WITH AUXILIARY CONTACT

Lucien Ferraz, Lyon, France, assignor to Societe Lucien Ferraz & Cie, Lyon, France

Filed Dec. 16, 1968, Ser. No. 784,021
Claims priority, application France, Dec. 26, 1967, 49,466
Int. Cl. H01h *85/30*
U.S. Cl. 337—5 **6 Claims**

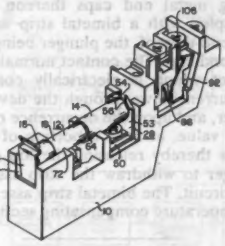


The cartridge fuse has a radially movable striker pin disposed in a peripheral chamber of the cartridge body, the cartridge being associated with an auxiliary contact mechanism disposed in front of the striker pin so as to be actuated thereby. In order to avoid, when the cartridge blows, the highly ionized hot gases which issue radially from the space between the striker pin and the wall of its housing chamber from blowing laterally between the periphery of the cartridge body and the contact mechanism, upon contact with the contact mechanism and thereafter flowing laterally towards the cartridge heads, a seal is provided between the mechanism or its support and the cartridge body. The gases expand in the space deliminted by the seal and they leak through the mechanism and/or the support to reach the ambient atmosphere in a cooled and disionized state.

3,593,247
TRIGGER FUSE SWITCH ASSEMBLY

James D. Collins, and Ralph B. Immel, both of Buffalo, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 24, 1969, Ser. No. 819,020
Int. Cl. H01h *85/50*
U.S. Cl. 337—5 **1 Claim**



A trigger fuse switch assembly wherein a trigger fuse may only be inserted into the assembly in its correct operative position being held in place by a spring terminal. When the fuse is tripped, the striker pin thereof engages a pushrod of the assembly to cause a movable contact to either make or break a circuit therebetween. The stationary contacts may be selectively placed to provide normally open or closed operation of the switch assembly.

3,593,248
THERMAL CONTROL MEANS

George Ronald Shepherd; Reginald Philip Burnham, and Donald Copage, all of Norwick, Norfolk, England, assignors to Diamond H. Controls Limited, Norwich, Norfolk, England

Filed Apr. 9, 1969, Ser. No. 814,542
Claims priority, application Great Britain, Apr. 10, 1968, 17416/68
Int. Cl. H01h *61/013*
U.S. Cl. 337—107 **9 Claims**

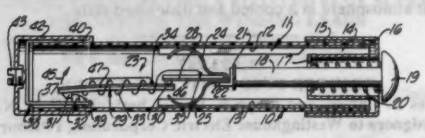
A thermal actuating device including a bimetal element with an electrical heating member which is resiliently coupled thereto. The resilient coupling permits relative movement between the bimetal and the heater upon deflection by the former. The heater is preferably a substrator heater.

3,593,249

CIRCUIT BREAKER WITH BIMETALLIC ELEMENT

Allan R. Sedgwick, North Hollywood, Calif., assignor to Bel-Aire Sales Corporation, Los Angeles, Calif.

Filed May 22, 1969, Ser. No. 826,866
Int. Cl. H01h 71/08
U.S. Cl. 337—113 9 Claims



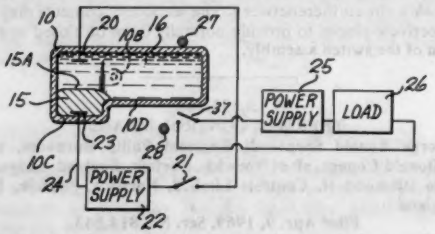
A circuit breaker device of relatively small, compact and simple construction and which may be used as a direct replacement for typical small cartridge fuses currently used in electronic and electrical equipment. The device includes a housing having metal end caps thereon. A spring-biased plunger is coupled with a bimetal strip assembly having a contact on an end thereof, the plunger being electrically coupled with one end cap. The contact normally is coupled with an other contact which is electrically connected with the second cap. Current flows through the device from one end cap to the other, and upon the occurrence of current above a predetermined value, at least a portion of the bimetal strip assembly flexes thereby releasing the top contacts. This allows the plunger to withdraw the strip assembly and break the electrical circuit. The bimetal strip assembly may include an ambient temperature compensating section.

3,593,250

ELECTRICAL-TO-MECHANICAL CONVERTER AND SWITCH ASSEMBLY

Elwood G. Norris, 2505 20th East, Seattle, Wash.

Filed Aug. 18, 1969, Ser. No. 850,912
Int. Cl. H01h 29/04, 37/36, 61/01
U.S. Cl. 337—114 7 Claims



An electrical signal input device which is operated by a small AC or DC signal with mechanical movement being obtained as a result of the signal. A container having a puddle of mercury therein is supported so that in a first position the surface tension of the mercury causes the mercury to stand above an elongated portion of the container. A conductive fluid inside the container is in contact with the surface of the mercury. A starter electrode engaged with the conductive fluid when energized causes the surface tension of the mercury to be broken so that the mercury runs into the elongated portion of the container. The weight of the mercury causes the container to pivot and thereby close a main load switch.

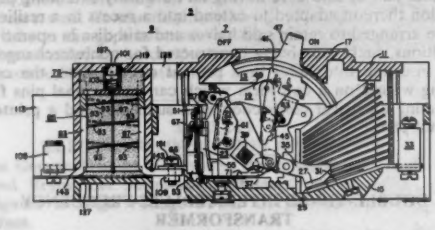
3,593,251

FUSE DEVICE

James C. Wilson, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 15, 1968, Ser. No. 752,848
Int. Cl. H01h 85/20
U.S. Cl. 337—186 8 Claims

An improved fuse device comprises an insulating housing and fuse means supported in the housing with external terminals extending out through openings at opposite ends of the housing for enabling connection of the fuse means in an electric circuit. The fuse device is a multipole fuse device, and terminal connectors, on the external terminals, are housed in cavities at one end of the housing.



3,593,252

POTENTIOMETER STRUCTURE

Morris A. Shriro, Mount Vernon, and Myron A. Coler, Scarsdale, both of, N.Y., assignors to Markite Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 740,259, June 26, 1968. This application June 5, 1969, Ser. No. 830,833
Int. Cl. H01c 5/02, 9/02
U.S. Cl. 338—132 6 Claims

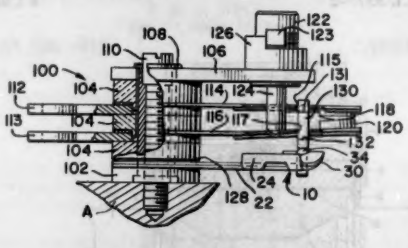
In a device such as a potentiometer or the like, means are provided for mounting and retaining the element so as to permit the elimination of coupling means such as conventional housings, tie rods, clamp rings, fasteners, or the like. The actuating shaft of the device is placed in tension thus permitting the use of a longer and more accurate track that also has greater power dissipation. Because of the absence of conventional coupling means, adjustment and compensation for errors may be made after assembly.

3,593,253

THERMOSTAT ACTUATOR BLADE ASSEMBLY

Ernest N. Taylor, 2231 E. 67th St., Chicago, Ill.

Filed July 28, 1969, Ser. No. 845,333
Int. Cl. H01h 37/52
U.S. Cl. 337—379 6 Claims



An actuator for use in a thermostat assembly comprising a blade formed from multilayered thermally responsive material. The blade includes spaced side legs joined at one end to define a blade area for connection to a heat source and further includes a compensating leg extending transversely between the spaced ends of said side legs and defining a point of actuation between the side legs. Each side leg defines an active leg portion adapted to quickly deform in response to heat to move the point of actuation a predeter-

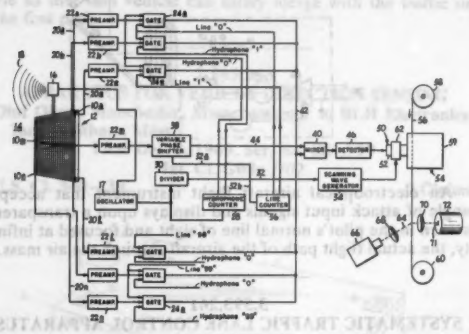
mined distance from an initial position. The compensating leg is adapted to receive heat from the side legs and respond by deforming so as to return the actuating point a predetermined distance toward its initial position to thereby compensate for additional movement of the actuation point induced by heat saturation of the side legs.

3,593,254

SONOGRAPHY SYSTEM

William E. Glenn, Jr., and Frank B. Gorman, both of Stamford, Conn., assignors to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Jan. 28, 1969, Ser. No. 794,564
Int. Cl. G01s 9/66
U.S. Cl. 340—3 7 Claims



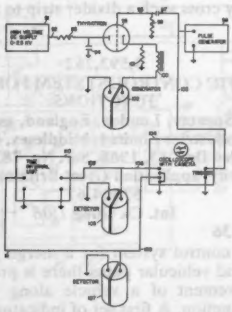
As described herein, the output signals generated by a plurality of hydrophones arranged in a generally rectangular array are scanned line-by-line by a signal having a selected frequency. The scanned signals are then combined with a reference signal which is generated by a centrally disposed hydrophone and which is selectively phased with respect to each of the scanned output signals. The selective phase relationship between the reference signal and each of the other scanned signals is maintained by appropriately shifting the phase of the reference signal at a frequency corresponding to the frequency of the line scanning frequency. The combined signals are thereafter recorded in a line-by-line pattern on thermoplastic film.

3,593,255

ACOUSTIC LOGGING TOOL HAVING OPPOSED TRANSDUCERS

James E. White, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed May 29, 1969, Ser. No. 838,364
Int. Cl. G01v 1/00, 1/04
U.S. Cl. 340—15.5 SW 10 Claims



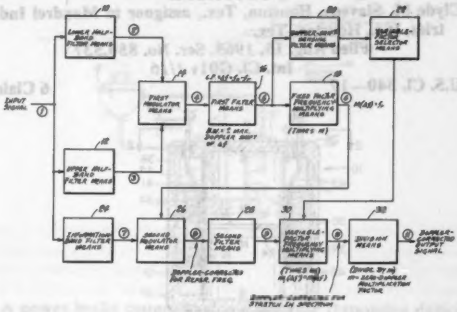
A logging tool having opposed paired transducers located on opposite sides of the borehole in both the source and the detector and methods for its use. One source transducer expands while the opposed transducer contracts and one detector transducer emits a positive electrical signal in response to inward pressure, while the other emits a negative electrical signal in response to inward pressure. The tool thus exploits flexural waves along a borehole and minimizes interference by the faster-traveling compressional waves.

3,593,256

DOPPLER CORRECTION TECHNIQUE

Edmund C. Gannon, Waterford, Conn., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 22, 1969, Ser. No. 868,369
Int. Cl. H04b 1/10
U.S. Cl. 340—5 R 8 Claims



Method and means for complete correction of Doppler shift in a transmitted spectrum of individual frequencies, or tones, constituting a multitone, coded pulse system in which the lowest (reference) and highest frequencies and the bandwidth are known and enclose an information band of frequencies. The upper and lower half-bands of the received signal are filtered out and mixed to provide the difference frequencies, one of which is a unique frequency corresponding to the spectrum bandwidth. This is filtered out and multiplied by a fixed factor to provide the zero-Doppler reference frequency. The latter is mixed with the information band, which has been filtered from the input signal, and the result is a signal which comprises the information band Doppler-corrected for the reference frequency. The signal corresponding to the spectrum bandwidth is also sent through means which senses the amount of Doppler-shift it has undergone, selects an inverse multiplying factor in accordance with this amount of shift and multiplies the reference-frequency-corrected information band, thereby correcting it for the Doppler-stretch the received information band has undergone. The information band is now completely Doppler-corrected and is divided by a zero-Doppler correction factor to correct the spectral spread introduced by the previous multiplication by said inverse multiplying factor.

3,593,257

ELECTROACOUSTIC TRANSDUCER

Frank Massa, Jr., Cohasset, Mass., assignor to Massa Division, Dynamics Corporation of America

Filed June 14, 1968, Ser. No. 737,198
Int. Cl. H04r 7/06
U.S. Cl. 340—9 20 Claims

The plate piston, vibratile diaphragm of an underwater transducer is divided by grooves to form a mosaic of piston element islands interconnected by a thin web. Each piston element is separately driven by an individually associated transducer element. The transducer elements may be coupled electrically to enable associated equipment to make a

phase comparison which gives directional information. The invention has particular utility when the diameter of the total

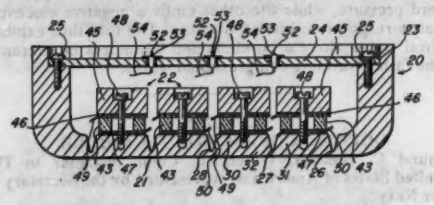
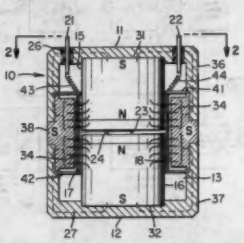


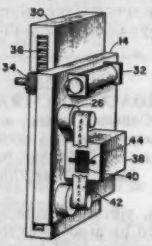
plate piston is greater than the wave length of the sound radiated into the water.

3,593,258
DUAL MAGNETIC CIRCUIT LOW LEAKAGE GEOPHONE
Clyde M. Slavens, Houston, Tex., assignor to Mandrel Indistries, Inc., Houston, Tex.
Filed Aug. 15, 1969, Ser. No. 850,537
Int. Cl. G01v *1/16*
U.S. Cl. 340—17 **6 Claims**



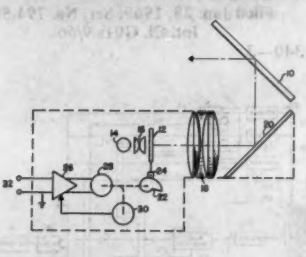
A geophone for detecting seismic energy wherein a pair of cylindrical magnets are coaxially mounted within a hollow cylindrical, magnetically permeable housing with a first set of like polarity pole faces of the magnets in spaced apart confronting relationship centrally of the housing and the remaining like poles in flux communication with opposite enclosed ends of the housing to form an air gap extending from the confronting poles to the surrounding interior housing wall. A sensing coil of hollow cylindrical shape is mounted for coaxial and resilient reciprocation in the air gap region, and the flux emanating from each of the confronting pole faces is forced by the mutual repulsion between such like poles to assume a radial path effectively traversing the coil, thereby minimizing undesirable flux leakage and consequently increasing the electrical output from the coil.

3,593,259
ALPHA-GAMMA FLIGHT PATH DISPLAY
Milo E. Stormo, Granada Hills, Calif., assignor to Singer-General Precision, Inc.
Filed Nov. 25, 1968, Ser. No. 778,520
Int. Cl. B64d *45/08*
U.S. Cl. 340—27 NA **1 Claim**



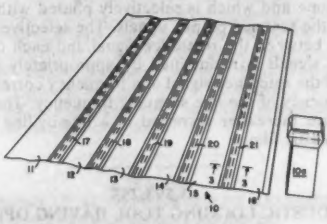
An electrooptical aircraft flight instrument that accepts input signals representing angle of attack and pitch angle. These signals are used to servo reticles that are projected at infinity upon a transparent screen in the pilot's normal line of sight and display the actual flight path of the aircraft and the angle, in degrees, between that flight path and the horizon.

3,593,260
FLIGHT PATH DISPLAY
Milo E. Stormo, 16352 Barneston St., Granada Hills, Calif.
Filed July 12, 1968, Ser. No. 744,397
Int. Cl. G08g *5/02*
U.S. Cl. 340—27 NA **3 Claims**



An electrooptical aircraft flight instrument that accepts angle of attack input signals and displays upon a transparent screen in the pilot's normal line of sight and focused at infinity, the actual flight path of the aircraft through the air mass.

3,593,261
SYSTEMATIC TRAFFIC LANE CONTROL APPARATUS WITH LIGHTS
Edward J. Dominguez, 1095 Myrtle St., San Jose, Calif.
Filed Oct. 11, 1968, Ser. No. 766,801
Int. Cl. G08g *1/00*
U.S. Cl. 340—36 **6 Claims**

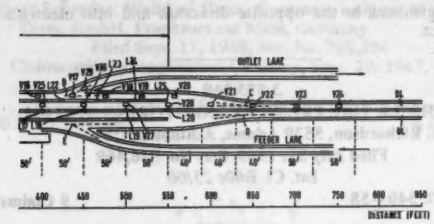


A system for controlling the direction of traffic flow in different lanes of a multiple lane road. The lanes of the road are separated by strips selectively illuminated by one or two rows of tubular type light sources which provide either two substantially solid illuminated lines indicating that traffic from adjacent lanes should not cross the strip to an adjacent lane, or which provide a single broken illuminated line to indicate that traffic may cross such a divider strip to an adjacent lane.

3,593,262
TRAFFIC CONTROL SYSTEM FOR MERGE JUNCTIONS
Rolf Edmund Spencer, London, England, assignor to Electric & Musical Industries Limited, Middlesex, England
Filed Dec. 13, 1968, Ser. No. 783,598
Claims priority, application Great Britain, Dec. 15, 1967, 57014/67
Int. Cl. G08g *1/08*
U.S. Cl. 340—36 **11 Claims**

In a traffic control system for a merge junction between first and second vehicular paths there is provided means for detecting movement of a vehicle along the second path towards the junction. A first set of indicators are arranged in succession along a length of the first path and in advance of the junction; the indicators being so controlled by the detecting means as to direct the creation of a moving gap in the

traffic on the first path. The moving gap is arranged to arrive at the merge junction simultaneously with the merging vehicle so that said vehicle can safely merge with the traffic on the first path.

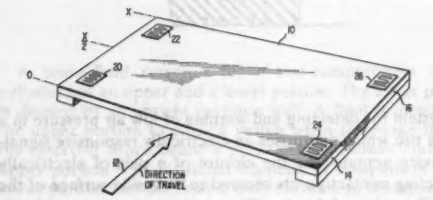


3,593,263

APPARATUS FOR VEHICLE DIRECTION SENSING

Oluf Olsen, Manchester, Mass., assignor to BLH Electronics, Inc., Waltham, Mass.

Filed Dec. 4, 1969, Ser. No. 881,999
Int. Cl. G08g 1/02
U.S. Cl. 340—39 **9 Claims**



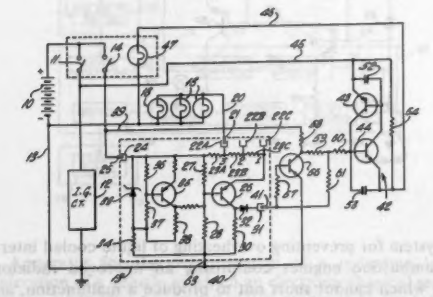
The direction of travel of a vehicle is determined by mounting four electrical strain gage elements at the four corners of a rectangular shaped platform and by interconnecting the same in a bridge circuit arrangement such that an output of a given polarity will be developed as the vehicle traverses a leading portion of the platform and an output of a different polarity will be developed as the vehicle traverses the trailing portion of the platform.

3,593,264

VEHICLE WARNING CIRCUIT

Carl E. Atkins, Montclair, N.J., assignor to Wagner Electric Corporation

Filed July 5, 1968, Ser. No. 742,559
Int. Cl. B60q 1/00
U.S. Cl. 340—52 **7 Claims**



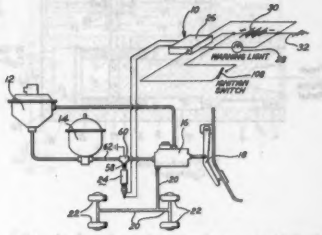
A warning circuit is provided for informing the operator of a vehicle when a remotely positioned vehicle lamp fails to light. The circuit includes a sensing circuit having a plurality of resistors connected in series with the lamps. A semiconductor circuit is coupled to the resistors and transmits an electrical signal to a warning means which may include a lamp or a buzzer. The circuit can be made to operate at any time the lamp switch is turned on. Operation of the circuit may be also limited to the condition when the ignition switch is turned on.

3,593,265

PRESSURE INDICATING SYSTEM

Donald W. Howard; Keith H. Fulmer, and Harold B. Schultz, all of South Bend, Ind., assignors to The Bendix Corporation

Filed Dec. 18, 1968, Ser. No. 784,775
Int. Cl. B60q 1/00
U.S. Cl. 340—52 C **19 Claims**



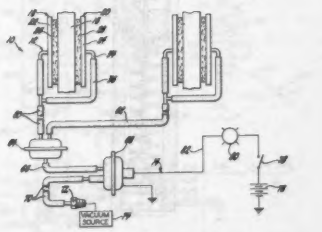
A power brake system having a pressure responsive device with three modes of response corresponding to three levels of pressure and an electronic control responsive to the output of the pressure responsive device to control a lamp to distinguishably indicate which of the three pressure levels is present.

3,593,266

DISC BRAKE WEAR MONITOR SYSTEM

John R. Van Sickle, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 16, 1969, Ser. No. 866,998
Int. Cl. B60q 1/44
U.S. Cl. 340—52 **8 Claims**



A brake lining wear warning system in which passages are formed at a predetermined depth in the lining and connected to the engine intake manifold through a vacuum switch. The switch operates a warning indicator when there is insufficient vacuum in the passages. When the lining wears to open a passage to atmosphere, the vacuum switch is closed and the warning indicator is energized. By wiring the indicator and vacuum switch through the ignition switch, the system is self-

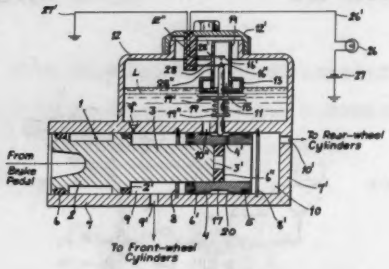
tested each time the ignition switch is turned on and before the engine is started and vacuum is generated in the vacuum circuit.

3,593,267

ELECTRICAL WARNING SYSTEM FOR VEHICULAR HYDRAULIC DUAL-BRAKE INSTALLATIONS

Hans-Christof Klein, Hattersheim, Germany, assignor to Teves Alfred GmbH, Frankfurt am Main, Germany

Filed Apr. 3, 1968, Ser. No. 718,630
Claims priority, application Germany, May 9, 1967, T 33 820
Int. Cl. G08b *21/00*; H01h *29/30, 35/38*
U.S. Cl. 340—52 **10 Claims**



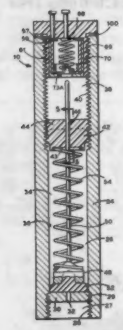
An electrical warning system for a dual hydraulic-brake network in which a tandem dual master cylinder whose floating piston shifts upon failure of one of the networks. This piston operates a switch which also may be operated by the fluid level in the brake-fluid reservoir to signal either or both of a failure in a network and a drop in the brake-fluid level.

3,593,268

AUTOMATIC PRESSURE WARNING DEVICE FOR PNEUMATIC UNITS

John A. Arvan, 9 South Main St, Port Chester, N.Y.

Filed Dec. 17, 1968, Ser. No. 760,257
Int. Cl. B60c *23/00*
U.S. Cl. 340—58 **4 Claims**



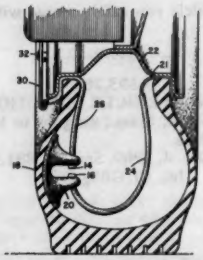
An improved automatic warning device for tires to identify pressures outside of predetermined ranges. The device is secured to a standard valve stem. An opening in a plug allows the interior tire pressure to bear against a spring biased plunger. The biasing force of the spring is varied by adjustment of a screw member. The plunger rod bears against a spring biased conductor and in the normal state, the rod maintains the conductor out of electrical contact. If the pressure falls below a certain level the plunger rod withdraws away from the conductor, and the conductor is moved by its biasing means into electrical contact. If the pressure rises above a certain level, the plunger rod bears more strongly against the conductor, and the conductor is moved against its biasing means in the opposite direction and into electrical contact.

3,593,269

VEHICLE TIRE PRESSURE MONITORING SYSTEM

Olin N. Richardson, 5539 Adams, Ashtabula, Ohio

Filed July 31, 1969, Ser. No. 846,469
Int. Cl. B60c *23/00*
U.S. Cl. 340—58 **9 Claims**



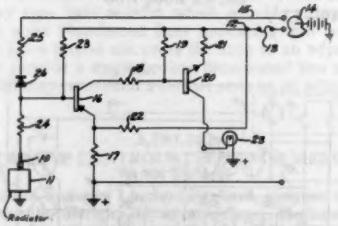
A system for detecting and warning of low air pressure in a vehicle tire which comprises an electrically responsive signaling device actuated by the closure of a pair of electrically conducting contact points secured to an inside surface of the sidewall portion of the tire. The contact points are vertically spaced from one another in a region of the tire wall which flexes in response to loss of air pressure within the tire. Electrical energy is supplied by the vehicle ignition system.

3,593,270

LIQUID LEVEL SENSING AND INDICATING SYSTEM

Richard E. Walker, 617 McCreadyAve., Cadiz, Ohio, and James D. Heckelman, Rte. #1, Huron, Ohio

Filed July 10, 1967, Ser. No. 652,184
Int. Cl. B60q *1/00*; H01h *29/00*
U.S. Cl. 340—59 **13 Claims**



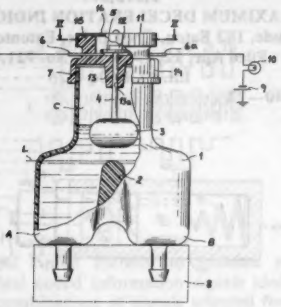
A system for preventing overheating of liquid cooled internal combustion engines comprising an improved radiator probe which cannot short out to produce a malfunction, an electronic warning circuit and an electronic test circuit so constructed that the test circuit can be relied upon to sense a failure in the alarm circuit without being masked by a compensating failure in the probe circuit.

3,593,271

BRAKE-FLUID-LEVEL ALARM FOR A TWO-COMPARTMENT MASTER-CYLINDER RESERVOIR

Gert Schrader, Walldorf Hesse, Germany, assignor to Alfred Teves, GmbH, Frankfurt am Main, Germany

Filed Sept. 17, 1968, Ser. No. 760,314
Claims priority, application Germany, Sept. 20, 1967, T 34 831
Int. Cl. B60t 17/22; G01f 23/10
U.S. Cl. 340—59 6 Claims



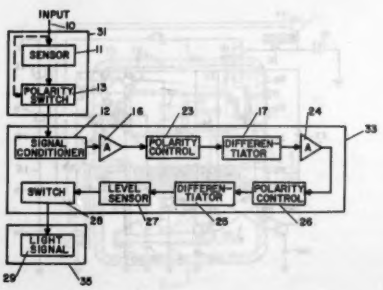
A brake-fluid reservoir for a two-compartment master cylinder has an upper and a lower portion. The lower portion is divided by an upright partition wall. A float is movable in the upper portion to close a switch when the brake fluid in the reservoir drops below a predetermined lower limit. The upper portion is of restricted diameter in comparison to the lower portion and the float is only movable in the upper portion directly above the wall which terminates short of the top of the reservoir.

3,593,272

SYSTEM FOR AUTOMATICALLY SENSING AND INDICATING A DECREASE IN THE ACCELERATION OF A VEHICLE

Robert W. Blomenkamp, Palo Alto, Calif., and Enrique J. Klein, 947 Alice Lane, Menlo Park, Calif., assignors to Enrique J. Klein, Menlo Park, Calif., by said Robert W. Blomenkamp

Filed Sept. 30, 1968, Ser. No. 763,672
Int. Cl. B60q 1/50; G01p 15/08
U.S. Cl. 340—62 7 Claims



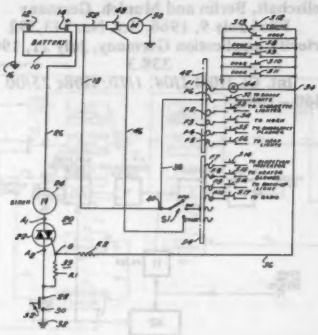
Apparatus for the determination of a reduction in acceleration of a vehicle in which an electromechanical sensing device generates an output signal in response to the rotation of a shaft turning at a fixed ratio to the vehicle drive shaft. Electronic circuitry processes the signal of the sensing device for controlling the operation of a light signal when a given level of reduction in acceleration is exceeded. The indicating system is integrated with the conventional vehicle light signals.

3,593,273

AUTOMOBILE THEFT ALARM

Rudor M. Teich, Union City, N.J., assignor to Babaco Research, Inc., North Arlington, N.J.

Filed Jan. 14, 1969, Ser. No. 790,968
Int. Cl. B60r 25/10
U.S. Cl. 340—63 14 Claims



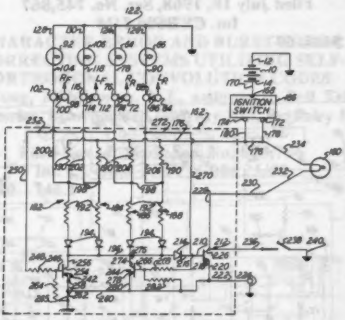
An automobile theft alarm comprises a semiconductor switch in operative circuit arrangement with the battery of a vehicle and a warning device. When current is drawn from the battery due, for example, to the unauthorized opening of a car door, and the resulting energization of the courtesy light, a voltage signal is applied to the control terminal of the switch to actuate that switch, thereby to energize the warning device.

3,593,274

LAMP FAILURE WARNING SYSTEM

Allen Dwane Krugler, Jr., Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 13, 1968, Ser. No. 736,742
Int. Cl. B60q 1/38; H05b 37/03
U.S. Cl. 340—67 6 Claims



A lamp-out warning system for lamps that are intermittently operated, particularly turn signal and brake lamps on an automotive vehicle, in which a warning means is provided for checking the lamps during the time that the lamps are not energized from their normal source of electric power. In an automotive vehicle the turn signal lamps or brake lamps are energized intermittently through either a flasher switch or a brake lamp switch, respectively. A warning is given when any

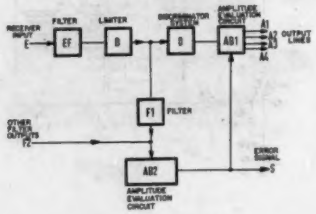
one of the lamps is burned out or otherwise inoperative but only when the lamps are burned out or otherwise inoperative but only when the lamps are not in their intermittently energized condition. This may be accomplished by the use of a disabling means which disables the warning means during the time of this intermittent operation.

3,593,275

METHOD AND APPARATUS FOR THE RECOGNITION OF ERRORS AT THE RECEIVER IN A DATA TRANSMISSION SYSTEM

Gerhard Pumpe, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 9, 1968, Ser. No. 743,392
Claims priority, application Germany, July 21, 1967, P 15 37 338.3
Int. Cl. H04l *1/04, 1/10*; G08c *25/00*
U.S. Cl. 340—146.1 **7 Claims**



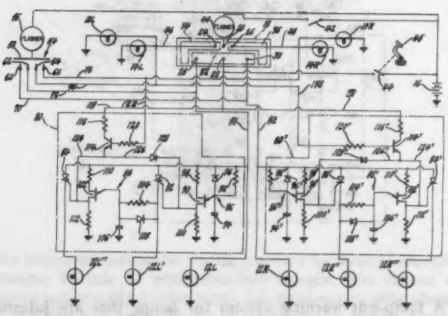
An error recognition process for a system in which data is transmitted in a one out of m different modulation characteristics (e.g. frequencies) code and wherein errors at the transmitter, or in the transmission system can cause a plurality of modulation characteristics to exist simultaneously at the receiver. The method of the invention takes advantage of the fact that modulation products outside of the assigned frequency band result when two different modulation characteristics are combined in a nonlinear device. Frequencies outside of the assigned band are detected to furnish an error voltage which blocks the decoded output at the receiver to prevent errors.

3,593,276

SEQUENTIAL DIRECTION SIGNALING SYSTEM

Robert K. Schuler, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 18, 1968, Ser. No. 745,867
Int. Cl. B60q *1/38*
U.S. Cl. 340—67 **3 Claims**



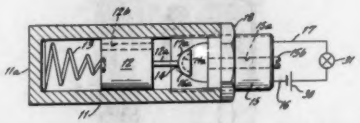
A direction signal circuit including a pair of electronic timers comprising a plurality of silicon controlled rectifiers and unijunction transistor relaxation oscillators interconnected with a direction signal switch to sequentially energize a plurality of left or right signal lamps to indicate a change of direction. The timers further include a transistor responsive to concurrent actuation of the direction signal switch and a brake pedal switch for simultaneously energizing all lamps on the side of the vehicle opposite the intended turn to indicate an impending deceleration of the vehicle in contemplation of the turn. The timers are also interconnected with a hazard warning switch to simultaneously flash all of the vehicle signal lamps to indicate an emergency or hazardous condition of the vehicle.

3,593,277

MAXIMUM DECELERATION INDICATOR

Rudolf Faude, 182 Eaton, Crest Drive, Eatontown, N.J.

Filed Apr. 12, 1968, Ser. No. 721,016
Int. Cl. B60q *1/26*
U.S. Cl. 340—72 **11 Claims**



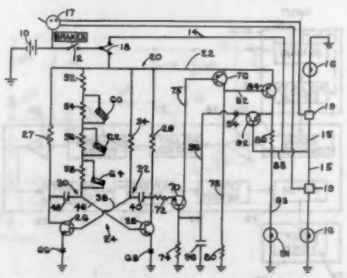
A device for providing an illuminated indication of rapid deceleration of a vehicle. A biased momentum sensor moves against the biasing force when an appropriate magnitude of deceleration is experienced to establish a closed circuit and thereby illuminate a lamp. The biasing force imposed upon the momentum sensor is adjustable over a broad range while at the same time maintaining the gap distance between the cooperating contacts of the device constant. The contacts are so arranged as to provide for locking of the device in the illuminated condition in situations involving extremely abrupt deceleration. Sensing means may also be provided for providing an illuminated indication of an attempt to bring the vehicle carrying the sensor to an abrupt halt.

3,593,278

VEHICLE BRAKE LIGHT SYSTEM

Frank D. Bower, 1042 Springhouse Road, Allentown, Pa., and Gordon B. Baumeister, 417 Margo Lane, Berwyn, Pa.

Filed May 29, 1968, Ser. No. 733,101
Int. Cl. B60q *1/44*
U.S. Cl. 340—72 **6 Claims**



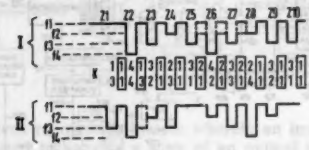
A vehicle brake light system is disclosed wherein a flashing signal of variable frequency indicates the rate of deceleration of a vehicle. The system includes a series of inertia switches and resistors forming a decelerometer, a multivibrator and a transistorized gate circuit which flashes the brake lights at a frequency proportional to the detected rate of deceleration.

3,593,279

METHOD AND CIRCUIT THEREFOR FOR EVALUATION OF RECEIVED CODED MESSAGES

Gerhard Pumpe, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 28, 1967, Ser. No. 671,264
Claims priority, application Germany, Sept. 30, 1966, S 106 281
Int. Cl. H04b *1/66*; H04l *1/04*
U.S. Cl. 340—146.1 17 Claims



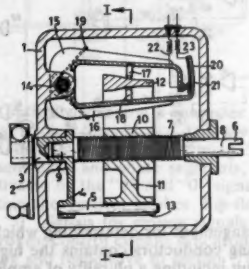
A method and circuit therefor to evaluate successive received individual coded information signals identified by predetermined combinations of signals selected from a plurality of fixed frequency signals. Hold signals are transmitted between successive individual coded information signals and are evaluated at the receiver which, in the absence thereof, produces a corresponding error indication signal that may be applied to the transmitter. The hold signals comprise a particular combination of signals selected from said plurality of fixed frequency signals, and individual signals comprising said particular combination also comprise some of the predetermined combinations of signals corresponding to the individual coded information signals.

3,593,280

REGULATOR DEVICE BASED ON INSPECTION OF THE THICKNESS OF A THREE DIMENSIONAL CAM IN THE FORM OF A PLATE PARTICULARLY FOR FUEL FEED ADJUSTMENT IN INTERNAL COMBUSTION ENGINES

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Via Gattamelata, Milan, Italy

Filed May 21, 1969, Ser. No. 826,492
Claims priority, application Italy, July 3, 1968, 18548 A/68
Int. Cl. H01c *15/00*
U.S. Cl. 338—150 4 Claims



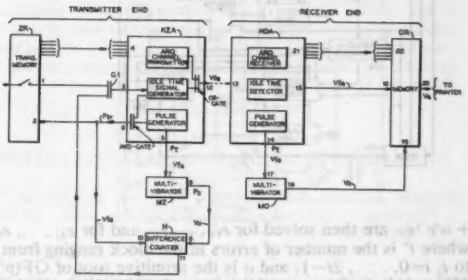
A regulator device in which two arms are resiliently urged on two opposite faces of a cam body, rotatable around its axis, and having variable thickness, whereby a rotation of said cam body causes a relative movement of said two arms and then a regulating effect acting on a control member.

3,593,281

COMPENSATED AUTOMATIC ERROR CORRECTION TELECOMMUNICATION SYSTEM

Hendrik Cornelis Anthony VanDuuren, Wassenaar, and Herman Da Silva, Voorburg, both of, Netherlands, assignors to De Staat Der Nederlanden, Ten Deze Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Filed May 6, 1969, Ser. No. 822,189
Claims priority, application Netherlands, May 10, 1968, 6806678
Int. Cl. H04l *1/18*
U.S. Cl. 340—146.1 6 Claims



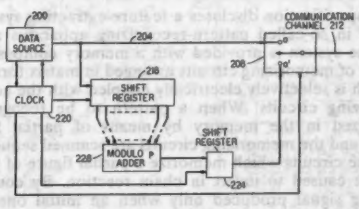
A telecommunication system between two stations involving automatic requests for repetition of received disturbed signals having means for speeding up the normal transmission rate between said stations and providing a storage device of a given capacity at the receiver to store the excess signals until they can be printed. A multivibrator controls the rate at which the signals are taken out of this storing device at the normal rate even when a delay occurs in the faster rate due to requests for repetition. Furthermore, a different counter is provided at the transmitter for determining the number of signals stored in the receiver which counter is controlled by opposing pulse series of the normal and speeded up rates from another multivibrator. Then when the counter determines the storage device is filled, it will stop the transmission of traffic signals and cause the transmitter to transmit an idle time signal until a space is provided in the storage device for more traffic signals.

3,593,282

CHARACTER-ERROR AND BURST-ERROR CORRECTING SYSTEMS UTILIZING SELF-ORTHOGONAL CONVOLUTION CODES

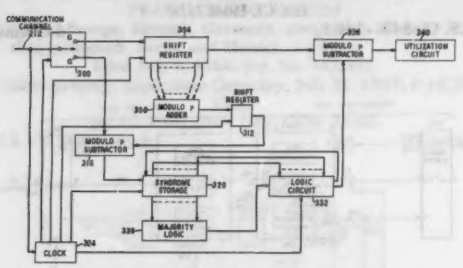
Shih Y. Tong, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 4, 1969, Ser. No. 873,796
Int. Cl. G06f *11/12*; G08c *25/00*
U.S. Cl. 340—146.1 9 Claims



Systems are disclosed for utilizing self-orthogonal convolution codes for correcting *t* character errors and certain

burst errors. The elements or characters of the code words of the particular code utilized are elements of a finite field $GF(p^l)$. Information characters are encoded into the code and transmitted along with parity characters to a receiving terminal where they are there decoded to obtain the syndrome thereof. The number of nonzero elements in a portion $\{S_0, S_1, \ldots, S_{2t-1}\}$ of the syndrome is then counted and if this number exceeds a threshold value t, it is assumed that errors have occurred in the block of characters being checked. The simultaneous equations $S_i = \alpha^{r_1 i} e_1 + \ldots$



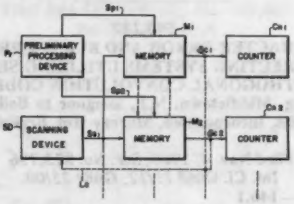
$+ \alpha^{r_{t'}} e_{t'}$ are then solved for $r_1, \ldots, r_{t'}$, and for $e_1, \ldots, e_{t'}$, where t' is the number of errors in the block ranging from 1 to t, $i=0, \ldots, 2t-1$, and α is the primitive root of $GF(p^l)$. The number of errors t' is determined as that t' which satisfies $t+1$ or more of the equations S_i. The values of r obtained from solving these equations identify the error positions in the received block of characters and each e_i gives the value of the error in the corresponding error position r_i. Each e_i is then added to the character in position r_i to thereby correct the erroneous characters.

3,593,283

FEATURE-EXTRACTING SYSTEM FOR PATTERN-RECOGNITION APPARATUS AND THE LIKE

Yoshikazu Miyamoto, Hachioji-shi, and Masao Hibi, Kodaira-shi, both of, Japan, assignors to Hitachi, Ltd., Tokyo-to, Japan

Filed Sept. 19, 1967, Ser. No. 668,798
Claims priority, application Japan, Sept. 19, 1966, 41/61388
Int. Cl. G06k *9/06*
U.S. Cl. 340—146.3 **14 Claims**



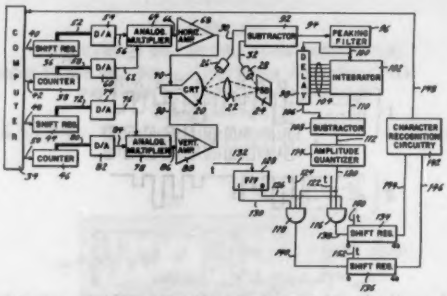
This specification discloses a feature-extracting system for the use in so-called pattern-recognizing apparatus and the like. The system is provided with a memory composed of a number of memorizing circuits arranged in matrix form, each of which is selectively electrically coupled with the adjoining memorizing circuits. When a pattern to be recognized is memorized in the memory by means of partial features thereof and the memorizing circuits are scanned sequentially, all of the circuits which memorize a partial figure of the pattern are caused to invert in chain reaction. By counting a counting signal produced only when an initial one of the memorizing circuits which have memorized the quantized partial features of the partial figures of the pattern is scanned, it is possible to determine the number of partial figures forming the pattern to be recognized.

3,593,284

RETROGRESSIVE SCANNING PATTERN

Alan I. Frank, Philadelphia; John A. Angeloni, Sr., Norristown; John J. McIntrye, Ardsley, and Ronald L. Baracka, Ambler, all of, Pa., assignors to Scan-Data Corporation, Norristown, Pa.

Filed Oct. 13, 1967, Ser. No. 675,236
Int. Cl. G06k *9/12*
U.S. Cl. 340—146.3 F **4 Claims**



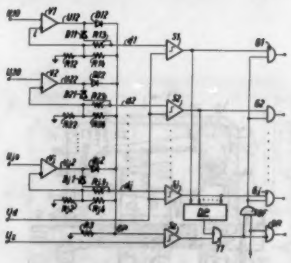
A retrogressive scanning pattern for use in a character recognition system having means for scanning a field and means responsive to the field for producing signals in accordance with the lightness or darkness of the area of the field at which the means for scanning is disposed. Control means are also provided for establishing the position on the field where the means for scanning is disposed. The control means also causes the scanning means to move in a retrogressive pattern across said field in both a horizontal and a vertical direction.

3,593,285

MAXIMUM SIGNAL DETERMINING CIRCUIT

Hanno Gillmann, Konstanz, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm Danbue, Germany

Filed July 31, 1968, Ser. No. 749,048
Claims priority, application Germany, Aug. 1, 1967, P 16 23 855.4
Int. Cl. G06k *9/02;* **H03k** *5/20*
U.S. Cl. 340—146.3 **11 Claims**



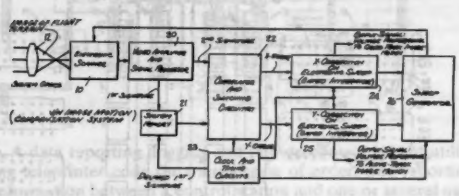
A circuit arrangement for determining which of a plurality of signal-carrying conductors contains the highest-amplitude signal, the circuit including a plurality of amplifiers each having an input connected to a respective line and feedback circuitry connected between the amplifier outputs and their inputs for producing, at a common point, a signal representing the output of that amplifier connected to the line containing the highest-amplitude signal and for causing each of the remaining amplifiers to produce an output which is approximately equal to the difference between its associated input signal and the highest input signal.

3,593,286

PATTERN RECOGNITION SYSTEM HAVING ELECTRONICALLY CONTROLLABLE APERTURE SHAPE, SCAN SHAPE, AND SCAN POSITION

Norman G. Altman, 32 Sammis Lane, White Plains, N.Y.

Filed Nov. 27, 1968, Ser. No. 779,442
Int. Cl. G06k 9/04; Ho4n 3/00
U.S. Cl. 340—146.3 12 Claims



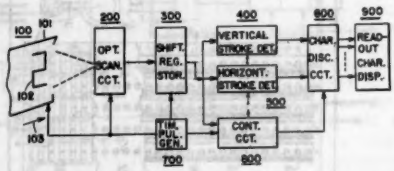
A pattern recognition system wherein an image dissector tube is used to provide a scan of an optical image, which scan, when used to establish the degree of similarity of two patterns or changes occurring in a single pattern, is capable of being modified to produce the maximum information required to establish said similarity or change, such modification being achieved by changing the electronic commands controlling the position and movement of the electronic image of the deflectable photomultiplier such that the size, shape, and position of the scanned area and the size of the effective aperture used to generate the scan is modified by appropriate control circuits (normally used in a feedback mode) to insure that the said modification increases the quantity, accuracy, and processability of the said information, full use being made of all a priori knowledge available to constrain scan size, shape, and position, and effective aperture size to further insure optimum scan parameters to provide the required information in the required form.

3,593,287

OPTICAL CHARACTER READER EMBODYING DETECTED VERTICAL STROKE RELOCATION

Hirao Kobayashi; Kazuo Kiji, and Yoshiyasu Kikuchi, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Apr. 8, 1969, Ser. No. 814,408
Claims priority, application Japan, Apr. 18, 1968, 43/26463
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3 J 26 Claims



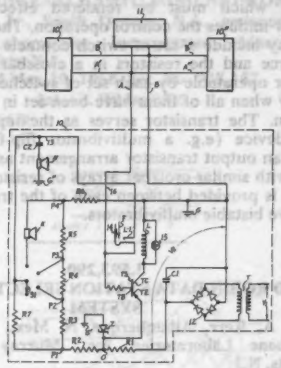
Apparatus for optically scanning a character having vertical and horizontal strokes formed as a dark area superposed on a white area in one plane for providing "1" and "0" signals to represent dark and white segments, respectively; shift registers activated by the "1" and "0" signals for storing signals representing the vertical strokes; flip-flops activated by the "1" and "0" signals for storing signals representing the horizontal strokes; control circuits synchronized with the character scanning and responsive to certain "1" signals for providing signals to control the activation of the shift registers and flip-flops; signal discriminating circuits activated by the vertical and horizontal stroke stored signals for providing output signals indicating a recognition of the scanned character; and equipment activated by the discriminating circuits output signals for reading out the scanned character. The control circuits include a further circuit for rearranging the vertical stroke signals in the shift register to identify a "1" character, for example.

3,593,288

VOICE DICTATION-TRANSCRIPTION STATION

Fred C. Bolick, Jr., and James B. Godwin, III, both of Atlanta, Ga., assignors to Lanier Electronic Laboratory, Inc., Atlanta, Ga.

Filed Aug. 2, 1968, Ser. No. 749,665
Int. Cl. H04q 3/00, 5/00
U.S. Cl. 340—147 10 Claims



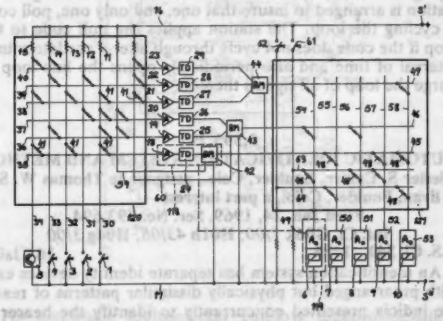
A voice dictation-transcription system in which a plurality of voice transmitting stations are located in positions relatively remote from the position of a central unit to which all of the plurality of transmitting stations are operatively connected so that the mode of operation of the central unit may be controlled from any transmitting station for the recording of information on a recording medium at the central unit. Each transmitting station provides a control voltage by which a disabling means and an indicating means are operated when the central unit is being operated from another transmitting station. In addition, each transmitting station provides a plurality of operating voltages from the control voltage for controlling the mode of operation of the central unit, preventing the operation of the central unit by another transmitting station, and indicating at other transmitting stations that the central unit is in operation.

3,593,289

ELECTRONIC PROGRAMMER FOR MACHINE-CONTROL SYSTEMS HAVING SIMULTANEOUS PLURAL INPUTS

Gerhard Lerch, Weilheim, and Egon Penzkofer, Munich, both of, Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich-Allach, Germany

Filed Oct. 1, 1968, Ser. No. 764,153
Claims priority, application Germany, Oct. 3, 1967, P 15 88 374.6
Int. Cl. H04q 1/00
U.S. Cl. 340—147 16 Claims



An electronic programming arrangement for machine operation in a system in which a switch arrangement has a

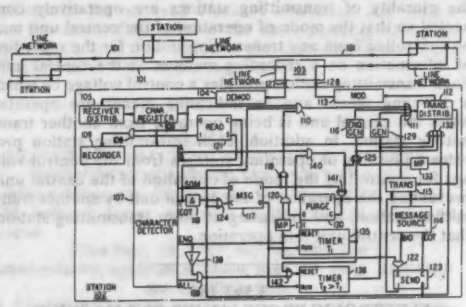
condition in which it represents a predetermined prior condition and is adapted to control an element, e.g. relay, electromagnetic valve or motor. The system has an amplifying transistor and circuitry for maintaining the transistor normally at a predetermined bias; the transistor being effectively connected with the machine-control element for operation thereof only upon the attainment of a predetermined operating bias. The switch arrangement includes a plurality of resistors in circuit with the transistor and the respective switch, each of which must be rendered effective before the transistor initiates the control operation. The switch arrangement may include a set of switch contacts in circuit with a DC source and the resistors in a crossbar array while the transistor operatable by each set of switches becomes effective only when all of them have been set in a predetermined condition. The transistor serves as the input to a bistable switch device (e.g. a multivibrator flip-flop) which can operate an output transistor arrangement as part of a switch system with similar crossbar arrays of resistors. A time delay network is provided between each of the transistors and the respective bistable multivibrators.

3,593,290

ROUND ROBIN DATA STATION SELECTIVE CALLING SYSTEM

Douglas A. Kerr, Albuquerque, N. Mex., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed July 17, 1969, Ser. No. 842,537
Int. Cl. H04l *21/00*; H04q *11/20*
U.S. Cl. 340—147 **10 Claims**



A transmission path arranged in a ring is looped through successive party line data stations. Any station can send to the other stations by splitting the line loop thereat and connecting the station transmitter to the outgoing side of the loop. All station transmitters are started by a common poll code which is sequentially passed from station to station until a bidding station is reached. The sending station reinitiates the cycling of the poll code by generating the code and applying it to the loop at the termination of the message. One station is arranged to insure that one, and only one, poll code is cycling the loop. The station applies the poll code to the loop if the code does not cycle through after a predetermined interval of time and also periodically opens the line loop to purge the loop of all signals thereon.

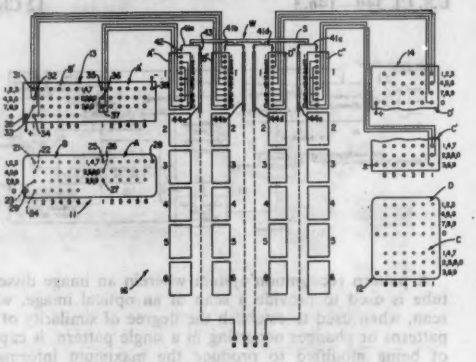
3,593,291

AUTOMATIC IDENTIFICATION SYSTEM AND METHOD

Giester S. Carter, Boulder, Colo., assignor to Thomas W. Sullivan, Boulder, Colo., a part interest

Filed Jan. 24, 1969, Ser. No. 793,694
Int. Cl. G06k *7/00*; H01h *43/08*; H04g *3/00*
U.S. Cl. 340—149A **16 Claims**

An identification system has separate identity devices each with prearranged but physically dissimilar patterns of readable indicia presented concurrently to identify the bearer of the devices, such as, coded credit cards and the like. The identification is made by successively reading either one or a combination of discrete areas on each card in a logical order to check for the presence of predetermined, logically related, like information characters on the cards by a reading mechanism. The identification may be made for a variety of



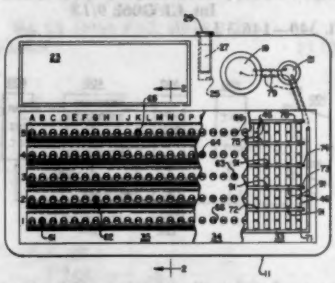
physical locations for the readable indicia on the cards, and a positive readout is developed to indicate whether or not the information characters on one card logically corresponds with the characters on the other card.

3,593,292

PERSONAL IDENTIFICATION CIRCUIT CARD DEVICE

Robert C. Scott, 340 Common St., Belmont, Mass.

Filed Oct. 7, 1969, Ser. No. 864,432
Int. Cl. H04q *1/00*
U.S. Cl. 340—149 A **15 Claims**



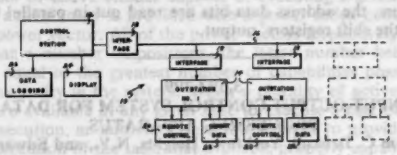
A credit card type device is disclosed in which identification of the bearer is made by means of his ability to complete a switching sequence of a concealed electric circuit within the card and thereby energize an electric lamp or other indicating means. The switching sequence of the circuit is completed by positioning each of a plurality of magnetically movable contact balls across a respective preselected pair of contacts. The balls are constrained to move in respective channels, each of which traverses a series of contact positions.

3,593,293

REMOTE CONTROL AND DATA LOGGING SYSTEM

Bjorn A. Rorholt, Trosterudveien 33, Slemdal; Oslo, Norway

Filed July 1, 1968, Ser. No. 741,592
Int. Cl. H04g 9/00
U.S. Cl. 340—152 11 Claims



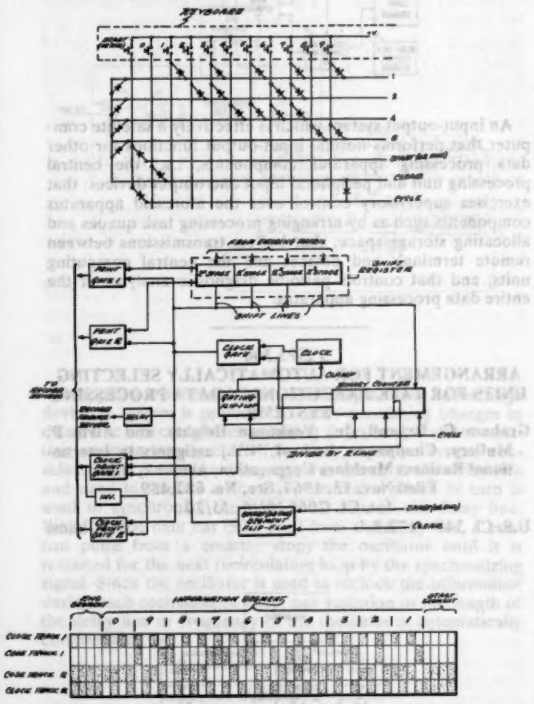
A data reporting, logging and remote control system utilizing teleprinter code for transmission of orders and reporting information between a control station and one or several outstations.

3 ,593,294

ARTICLE IDENTIFICATION SYSTEM

Zwi Kohorn, Cambridge, and Harold H. Seward, Arlington, both of, Mass., assignors to Compu-Reader, Inc., Boston, Mass.

Filed Aug. 2, 1968, Ser. No. 749,680
Int. Cl. H04g 3/00
U.S. Cl. 340—152 9 Claims



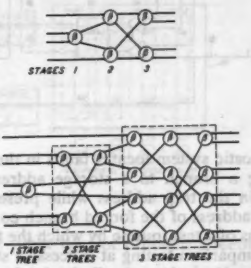
A system for automatically identifying an article by applying to it a coded record which is accurately sensed by a reader in spite of limited misorientation of the record during sensing. The record includes coded data tracks framed within clock tracks. The data and clock elements of these tracks are in identical space relationship. Each track is provided with a sensing device, the sensing devices associated with the clock tracks being displaced upstream of the data sensing devices by a distance equivalent to one-half the length of a data or clock element. The clock track sensing devices are connected to a detector arrangement which responds to the conditions at the end of a clock element in each clock track to effect reading of data elements then adjacent their associated sensing devices. The data which is read is thereafter distributed to data display and/or data storage devices.

3,593,295

REARRANGEABLE SWITCHING NETWORK

Amos E. Joel, Jr., South Orange, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 10, 1968, Ser. No. 728,157
Int. Cl. H04m 9/06
U.S. Cl. 340—166 R 4 Claims



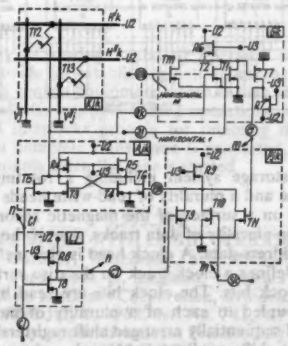
Rearrangeable switching networks are disclosed employing various combinations of two-by-two cross-point switch modules, designated binary modules to signify the restriction on their operating capability to the interconnection of the two input terminals with the two output terminals in a maximum of two electrically conductive configurations, the networks comprising only the two-by-two cross-point binary modules.

3,593,296

ELECTRONIC MULTISELECTOR

Pierre Girard, Paris; Marc Jean Pierre Leger, Issy-Les-Moulineaux; Claude Paul Henri Lerouge, Maurepas (Yvelines), and Jacques Henri De Jean, Ris-Orangis, all of, France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 28, 1969, Ser. No. 819,700
Claims priority, application France, Apr. 30, 1968, 150086
Int. Cl. H04g 9/00
U.S. Cl. 340—166 4 Claims

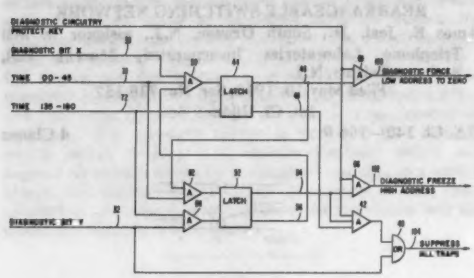


An electronic multiselector employs metal-oxide-silicon FET transistors in logic circuits comprising NOR gates and inverters. Horizontal selection signals are delivered by a shift register which provides line scanning in a selection stage.

3,593,297
DIAGNOSTIC SYSTEM FOR TRAPPING CIRCUITRY

Karl Kadner, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 12, 1970, Ser. No. 10,956
Int. Cl. G06f 11/04
U.S. Cl. 340—172.5 6 Claims

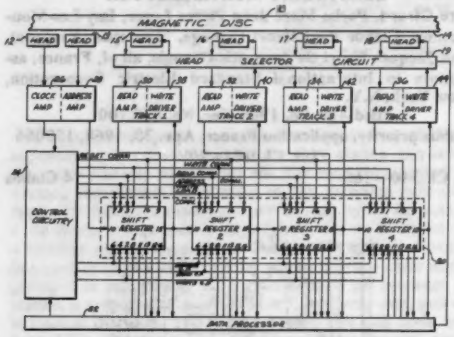


A diagnostic system locates faults in the trapping circuitry by forcing a branch to a storage address other than that specified in the trap address while preserving the trap address, the address of the forced branch containing successive instructions of a test routine by which the trap address is read out for comparison testing at successive stages until the trap address has been through all the hardware by which it is processed in a normal trap operation.

3,593,298
DIGITAL STORAGE SYSTEM HAVING A DUAL-FUNCTION SEGMENTED REGISTER

Richard D. Armstrong, Canoga Park, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 19, 1970, Ser. No. 12,722
Int. Cl. G11b 13/00
U.S. Cl. 340—172.5 15 Claims

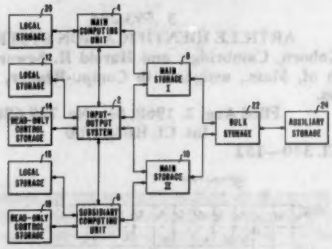


A digital storage system including a rotating magnetic recording disc and a plurality of read-write heads adjacent to and defining on a surface of the magnetic recording disc a corresponding plurality of data tracks, one of the data tracks containing address data. A clock head is also included in the system and defines a clock track on the disc surface for the storage of clock bits. The clock bits are read by the clock head and coupled to each of a plurality of independently operable and sequentially arranged shift registers for causing bits of data to shift serially through such registers. During information data read and write modes of operation, each shift register operates independently of one another to either: (1) receive serial read data bits at its input and supply them in parallel at its output; or (2) receive parallel write data bits at its input and supply them in series at its output. During the address data read mode of operation, however, serial address data bits are supplied only at the input of the first-in-sequence of shift registers and are then serially shifted through all the shift registers which operate together as a single continuous shift register. When the first address data bit is finally registered in the last-in-sequence of shift registers and the last address data bit in the first-in-sequence of shift registers, the address data bits are read out in parallel from all of the shift registers' output.

3,593,299
INPUT-OUTPUT CONTROL SYSTEM FOR DATA PROCESSING APPARATUS

Graham C. Driscoll, Yorktown Heights, N.Y., and Edward H. Sussenguth, Los Altos, Calif., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed July 14, 1967, Ser. No. 653,499
Int. Cl. G06f 15/00
U.S. Cl. 340—172.5 4 Claims

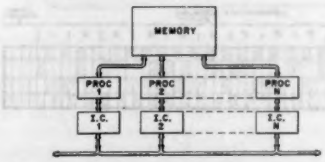


An input-output system which is effectively a satellite computer that performs normal input-output functions for other data processing apparatus components, i.e., the central processing unit and peripheral input and output devices; that exercises supervisory control over the aforesaid apparatus components such as by arranging processing task queues and allocating storage space; that buffers transmissions between remote terminals and devices and the central computing units; and that controls periodic diagnostic analyses of the entire data processing apparatus.

3 ,593,300
ARRANGEMENT FOR AUTOMATICALLY SELECTING UNITS FOR TASK EXECUTIONS IN DATA PROCESSING SYSTEMS

Graham C. Driscoll, Jr., Yorktown Heights, and Alvin P. Mullery, Chappaqua, both of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1967, Ser. No. 682,459
Int. Cl. G06f 15/16, 15/20
U.S. Cl. 340—172.5 5 Claims



An arrangement in a data processing system which comprises a multiplicity of active components, or entities, such as processors, I/O devices, channels, etc., that have overlapping but not necessarily identical capabilities wherein there is enabled an automatic selection of an active entity for the execution of a chosen task by the use of hardware. In this regard, each active entity has associated therewith a capability factor, or vector, wherein each discrete position of the vector is related to a particular capability of the component, each

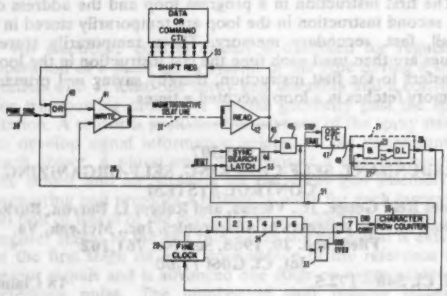
capability being assigned an individual power weight. It is stipulated that a requirement vector be given as part of the specification of each task, the requirement vector being the same length as the capability vector, registered positions in the requirement and capability vectors pertaining to the same capability. In order to enable the selection of one of a number of active entities capable of executing a given task, each active entity is provided with a power index contained in a power vector. All of the power vectors respectively have the same number of positions, the latter number being at least equal to the greatest number of capabilities possessed by any entity in the system. When a plurality of active entities are available at any given time to execute a task offered for execution, an automatic selection is made to provide, for the execution of the task, that available properly capable active entity which has the lowest power index, the power index being the sum of the weights of the capabilities of a given active entity as set forth in its power vector.

3,593,301

DELAY LINE SYNCHRONIZING SYSTEM

Charles E. Newcomb, Woodstock, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1968, Ser. No. 697,741
Int. Cl. G06f *13/02*
U.S. Cl. 340—172.5 **3 Claims**



In a pulse reiterating system including a delay line storage device, a system is provided for accommodating changes in delay line characteristics resulting from temperature variation or variations in clock frequency, or other system considerations. A synchronizing signal is stored in the delay line and used to control a start/stop oscillator which in turn is used to synchronize the read-in of data to the delay line. When all the data has been read from the delay line, a control pulse from a counter stops the oscillator until it is restarted for the next recirculation loop by the synchronizing signal. Since the oscillator is used to reclock the information during each recirculation loop, any variation in the length of the delay line or frequency of the oscillator is automatically compensated for.

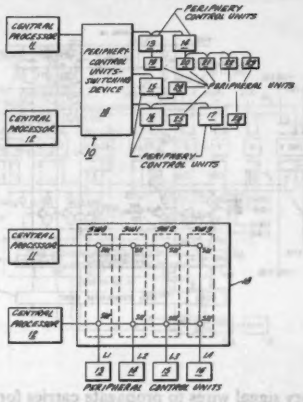
3,593,302

PERIPHERY-CONTROL-UNITS SWITCHING DEVICE

Masato Saito; Yukiyoshi Ochi, and Toshihiko Kawanishi, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Mar. 29, 1968, Ser. No. 717,158
Claims priority, application Japan, Mar. 31, 1967, 20528
Int. Cl. G05b *19/00*; H04q *3/00*
U.S. Cl. 340—172.5 **10 Claims**

Switching means for use in interconnecting a plurality of central processors with a plurality of peripheral units automatically so as to allow instantaneous switchover for the purpose of computation in a priority arrangement, or, alternatively, to allow for coupling of the peripheral units to a standby central processor under control of a program command in the case where the online central processor experiences a



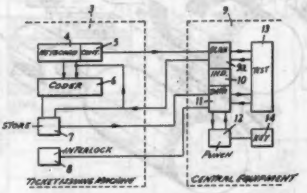
failure, a defect, or other type of problem affecting normal operation.

3,593,303

TICKET ISSUING MACHINES FOR TOTALISATOR SYSTEMS

Leslie T. J. Streets, High Wycombe, England, assignor to Bell Punch Company Limited, London, England

Filed June 3, 1968, Ser. No. 734,120
Claims priority, application Great Britain, June 7, 1967, 26243
Int. Cl. G06f *15/28*
U.S. Cl. 340—172.5 **12 Claims**



A plurality of storing keyboard operated ticket issuing machines provide for establishing betting transactions in conjunction with central equipment which is time shared. Provisions are made for multiple betting operations such as Quinella. Special interlocks provide for retaining the keyboard status until a complete transaction is processed, and to lock out the keyboards when the race is started.

3,593,304

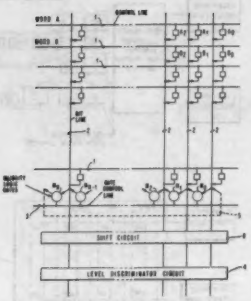
DATA STORE WITH LOGIC OPERATION

Peter A. E. Gardner, Winchester, and Michael H. Hallett, Chandlers Ford, both of, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 1, 1968, Ser. No. 741,701
Claims priority, application Great Britain, July 29, 1967, 34961/67
Int. Cl. G06f *7/06*
U.S. Cl. 340—172.5 **6 Claims**

This disclosure teaches a memory that performs logical operations by combining two or more words of data in a single storage location or on a storage signal carrying wire such

that the data signals combine in ways that have logical significance. Threshold logic circuits are connected with the



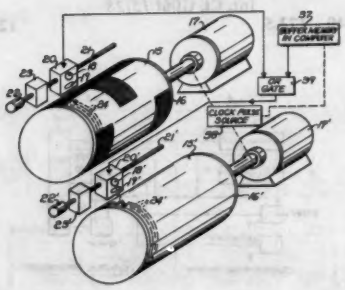
memory signal wires to propagate carries for addition or subtraction.

3,593,305

SYSTEM AND METHOD FOR MAKING UP A NEWSPAPER PAGE

William A. Hadley, Tappan, N.Y., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Aug. 19, 1968, Ser. No. 753,680
U.S. Cl. 340—172.5 1 Claim



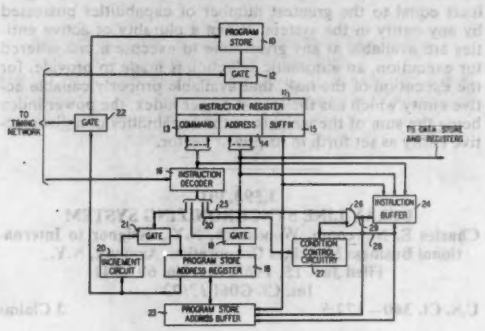
In the present system and method a photographic scanning recorder is controlled alternately by a scanning transmitter and a digital computer. The scanning transmitter scans a master page displaying material such as large headlines, pictures and advertisements. The digital computer processes story texts allocated to the remaining column spaces on the page. The computer provides column justification of its "raw" story text input, storing in its memory the coded identity and page location of each typographic character in the story text. Also stored in the computer memory are character-generating data for every typographic character that may appear in the text. The computer scans its memory electronically in accordance with the scanning operation of the photographic recorder to provide binary output signals to the recorder which cause the latter to record narrow segments of the typographic characters at the proper locations on the page. During one complete scanning of the record page in the photographic scanning recorder, both the material read from the master page in the scanning transmitter and the story texts are recorded on the record page in the recorder.

3,593,306

APPARATUS FOR REDUCING MEMORY FETCHES IN PROGRAM LOOPS

Wing N. Toy, Glen Ellyn, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed July 25, 1969, Ser. No. 844,914
Int. Cl. G06f 9/12
U.S. Cl. 340—172.5 8 Claims



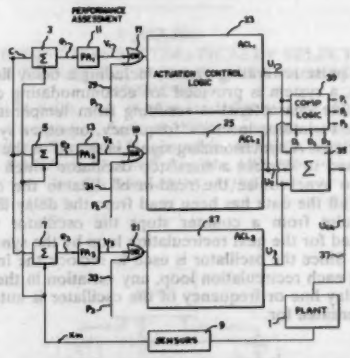
The first instruction in a program loop and the address of the second instruction in the loop are temporarily stored in a small, fast, secondary memory. These temporarily stored values are then used each time the last instruction in the loop transfers to the first instruction, thereby saving $n-1$ primary memory fetches in a loop executed n times.

3,593,307

REDUNDANT, SELF-CHECKING, SELF-ORGANIZING CONTROL SYSTEM

James Reid Gouge, Jr., Vienna, and Robert L. Barron, Burke, both of, Va., assignors to Adaptronics, Inc., McLean, Va.

Filed Sept. 20, 1968, Ser. No. 761,162
Int. Cl. G06f 11/00
U.S. Cl. 340—172.5 18 Claims



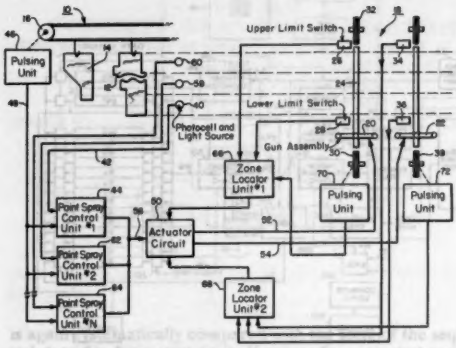
A self-organizing control system having a plurality of self-organizing controllers acting in parallel to provide actuation signals for plant control. The controllers are constantly monitored to locate faulty controllers. When one controller does not compare with the others, it is initially coerced to operate correctly and, after a predetermined period, if correct operation is not provided, the faulty controller is removed from the system. In one embodiment, an odd number of controllers is always in the system to provide control on a majority basis. Therefore, the removal of a faulty controller will require the removal of an operating controller as well.

3,593,308

PAINT SPRAY CONTROL SYSTEM

John C. Fagan, Oak Lawn, Ill., assignor to Amtron, Inc., Midlothian, Ill.

Filed Oct. 30, 1968, Ser. No. 771,865
Int. Cl. G04b *3/06*; G11c *19/00*
U.S. Cl. 340—172.5 7 Claims



An electronic control circuit is disclosed for regulating operation of a paint spray system of the type having a spray station with at least one spray gun assembly and a conveyor for transporting objects of diverse geometry past the spray station. A sensor is positioned in advance of the spray station to develop signal information related to the dimensions of each object. A plural stage shift register is coupled between the sensor and an actuator for the spray gun assembly. A measuring unit provides a reference pulse for each incremental unit of travel of the conveyor to periodically gate the shift register stages to the end that a unit storage signal is entered in the first stage on each coincidence of the reference and sensor signals and is advanced one stage on every successive reference pulse. The number of shift register stages is selected so that the pulse reaches the actuator coincidentally with the sensed object reaching the spray station. Other features are disclosed.

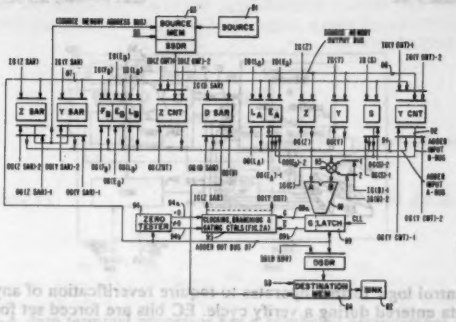
3,593,309

METHOD AND MEANS FOR GENERATING COMPRESSED KEYS

William A. Clark, IV, Poughkeepsie, N.Y.; Kent A. Salmond, Los Gatos, Calif., and Thomas S. Stafford, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1969, Ser. No. 788,807
Int. Cl. G11b *13/00*
U.S. Cl. 340—172.5 120 Claims

Electronically compressing a sorted sequence of uncompressed keys, each having an associated pointer address for accessing the information represented by the key. Compression is by electronic transfer of the remaining part of any key after removing some or all of (1) high-order "factored" bytes, and (2) low-order "noise" bytes. The transferred parts of a key are delineated using an electronic device for comparing like-ordered bytes in their sorting order in adjacent uncompressed keys. The comparing device determines a difference-byte position as the highest-ordered unequal byte position in every pair of adjacent keys. The "noise" bytes are electronically sensed as the bytes having a lower-order than the difference byte. The "factored" bytes are electronically sensed at higher-order positions than the difference-byte; and they are vicariously represented in prior compressed keys due to the sorted nature of the key sequence. In some cases, the "factored" bytes include the difference byte; and in other cases the "factored" bytes do not include all bytes having a higher-order than the difference-byte position. The pointer with each uncompressed key is associated with a related compressed key. A count field is generated with each compressed key to indicate the size of the factor field and number of transferred key bytes.

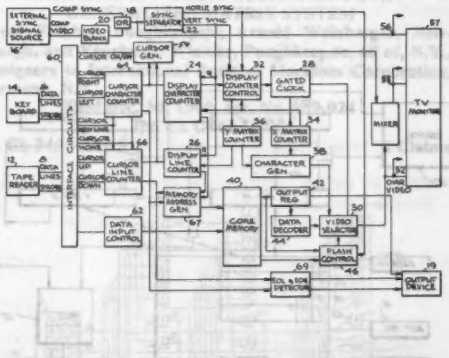


3,593,310

DISPLAY SYSTEM

James M. Kievit, Des Plaines, Ill., assignor to A.B. Dick Company, Chicago, Ill.

Filed May 14, 1969, Ser. No. 824,653
Int. Cl. G06f *3/14*
U.S. Cl. 340—172.5 12 Claims



A system is provided for enabling the information being displayed on a cathode-ray tube of a display system to appear to move upward or downward vertically across the face of the tube.

3,593,311

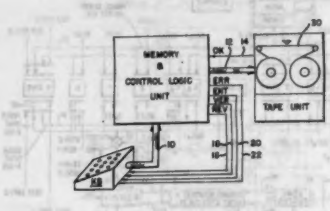
DATA RECORDER WITH SINGLE OPERATOR ENTRY-VERIFY CONTROL

Earl W. Caldwell, Mohawk, N.Y., assignor to Mohawk Data Sciences Corporation, Herkimer, N.Y.

Filed June 18, 1969, Ser. No. 834,422
Int. Cl. G06f *11/00*
U.S. Cl. 340—172.503 20 Claims

A key-to-magnetic tape data recorder is provided with control logic which requires the operator to key-verify each block of data immediately after it has been key-entered into a buffer memory and prior to its recordation on tape. During

an entry cycle each character that is entered into the buffer memory is compared with the character it is replacing and a set error control (EC) bit is loaded into a control memory for each unequal comparison. EC bit data is inspected during the following verify cycle and if a set EC bit is encountered during a duplication operation it triggers an error alarm. The



control logic further operates to require reverification of any data entered during a verify cycle. EC bits are forced set for any such verify-entered data and are employed at the culmination of the verify cycle to automatically restore the buffer memory accessing circuits to the first verify-entered data character, enabling rapid and simple reverification.

3,593,312

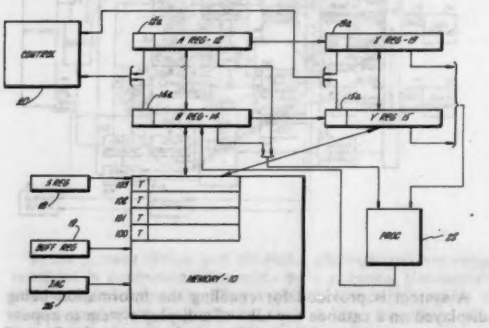
DATA PROCESSOR HAVING OPERAND TAGS TO IDENTIFY AS SINGLE OR DOUBLE PRECISION

Robert S. Barton, Salt Lake City, Utah; Carl B. Carlson, Arcadia; Bobby A. Creech, Glendora; Benjamin A. Dent, Altadena, and Erwin A. Hauck, Arcadia, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of application Ser. No. 668,460, Sept. 18, 1967, now abandoned. This application Nov. 14, 1969, Ser. No. 871,621

Int. Cl. G06f *7/00, 9/00*

U.S. Cl. 340—172.5 **25 Claims**



A data processor having a memory in which stacks of information are stored. The top two words of an information stack, currently being operated on, are stored in two registers external to memory. An extension register is provided for each of the aforementioned registers to allow the handling of double length information units. The operand words stored in the registers have tag bits as a part thereof which identify the operands as single or double word length information units. Control circuitry is responsive to the tag bits for causing the words to be automatically manipulated or handled as single or double word length information units. A processing unit processes the data stored in the registers.

3,593,313

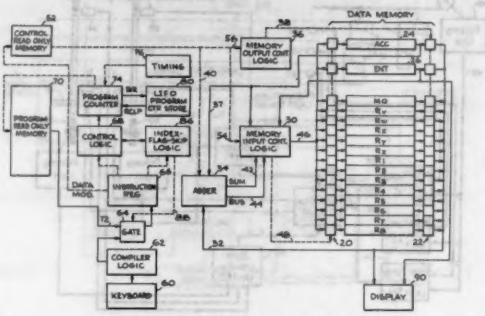
CALCULATOR APPARATUS

Carlos A. Tomaszewski, Canoga Park; Timothy A. R. Goodliffe, Woodland Hills; Norman J. Grannis, Los Angeles; Irving Sperling, Van Nuys, and Connable F. Wills, Venice, all of, Calif., assignors to Computer Design Corporation, Santa Monica, Calif.

Filed Dec. 15, 1969, Ser. No. 885,020

Int. Cl. G06f *9/06, 15/02*

U.S. Cl. 340—172.5 **27 Claims**



An electronic calculator apparatus capable of storing a plurality of multidigit numbers and of performing operations with respect to those numbers. Operations are defined by two levels of instructions; i.e.; (1) a user level specified by keyboard actuations, and (2) an internal or microprogrammed level comprised of instructions primarily extracted from a program read-only memory. In operation, user or keyboard instructions initiate subroutines which are read from the program read-only memory and which may be comprised of a sequence of up to several thousand internal instructions. The calculator apparatus includes an alterable data memory comprised of a plurality of shift registers. Input and output control logic respectively control the flow of data to and from the data memory. The control logic is responsive to control information, read from a control read-only memory, specified by data modifying internal instructions delivered to an instruction register from the program read-only memory. Instruction codes can also be delivered to the instruction register from compiler logic responsive to keyboard actuations. The instruction sequence read from the program memory is defined by a program counter which is normally successively incremented by one. However, certain instructions can cause the program counter to skip, jump, or branch. When the program counter is caused to branch, the prior program count plus one is stored in a "last-in first-out" memory for later recall. The compiler logic functions to convert keyboard actuations presenting a problem in algebraic notation to a "Polish" notation required for calculator operation. A learn mode programmer can optionally be included for storing programs comprised of keyboard level or internal level instructions. The learn mode programmer can be loaded either from the keyboard or from some storage medium such as punched cards. Once the programmer has been loaded it is treated by the calculator just as if it constituted a portion of the program read-only memory.

3,593,314

MULTISTAGE QUEUER SYSTEM

Edward W. Moll, King of Prussia, Pa., assignor to Burroughs Corporation, Detroit, Mich.

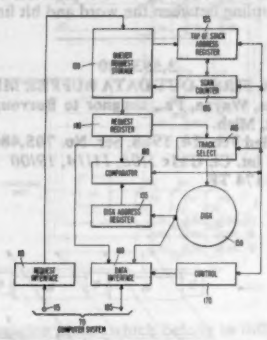
Filed June 30, 1969, Ser. No. 837,607

Int. Cl. G11b *13/00;* **G06f** *7/00*

U.S. Cl. 340—172.5 **9 Claims**

Queuing systems for storing access request words for a rotating disc file or other sequential access device and implementing them individually as the device becomes ready to effect the corresponding data transfers. The access request words are stored initially in a large capacity cyclically

scanned memory unit and are then transferred to a smaller capacity, more rapidly scanned memory unit as the corresponding file locations in the storage device are upcoming. The request words in the first memory are systematically compared for transfer to the secondary memory, where each

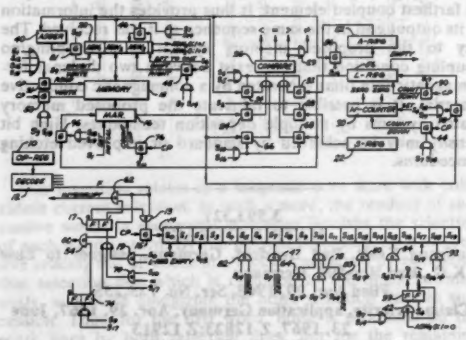


is again systematically compared with the state of the sequential data file for access to it. If access for a request word in the second memory is not established when the corresponding data file address is reached, (device becomes ready for it) the request is transferred back to the first memory unit.

3,593,315
METHOD AND APPARATUS FOR DEALLOCATING SMALL MEMORY SPACES ASSIGNED TO A COMPUTER PROGRAM

Rajani M. Patel, Arcadia, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 17, 1969, Ser. No. 858,574
Int. Cl. G06f *9/00*
U.S. Cl. 340—172.5 **10 Claims**

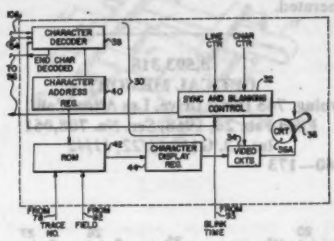


An arrangement for deallocation of small spaces in an addressable memory no longer needed for use by a computer program. Blocks of memory are each subdivided into a predetermined number of equal areas. The base address of a block, the size of the subdivided areas in the block, and the availability status of each area in the block are specified in a status word stored as one of a list of such status words in memory. Whenever a particular size area is no longer needed in memory, the status words are examined to locate a block having an area of the required size. The addresses of each area in the block are then examined to find an area having a specified address. If the specified area address is found, the associated status bit in the status word in memory is reset to indicate the area is again available for use by the computer program. If all other areas in the same block are also available, the status word for that block is eliminated from the list.

3,593,316
DATA TERMINAL PROCESSOR

Neil G. Frieband, Framingham; Douglas D. Kendrick, Northborough, and James F. Upton, Sudbury, all of, Mass., assignors to Incoterm Corporation, Weston, Mass.

Filed Nov. 3, 1969, Ser. No. 873,356
Int. Cl. G06f *3/14, 15/16*
U.S. Cl. 340—172.5 **20 Claims**

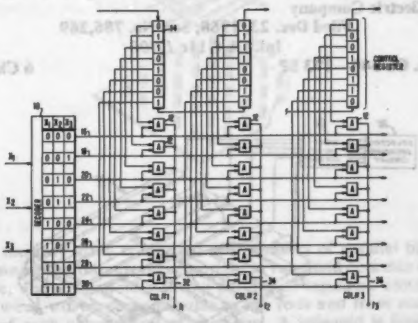


A data terminal processor has a combined arrangement of computational logic components and display-refreshing logic components which enables it to perform both computational and display-refreshing operations with many of the same components, particularly the arithmetic and memory components. The processor monitors the projection of display lines and the sweep of the traces forming display lines to change between the compute mode of operation and the refresh mode during the sweep of interline spaces and the sweep of lines outside the display lines that are to be used. Further, the processor operates in the refresh mode without recourse to the program counter or accumulator, and hence compute-mode information stored therein is ready for immediate use upon the resumption of computational operations.

3,593,317
PARTITIONING LOGIC OPERATIONS IN A GENERALIZED MATRIX SYSTEM

Harold Fleisher, Poughkeepsie; Arnold Weinberger, Newburgh, and Vaughn D. Winkler, Poughkeepsie, all of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

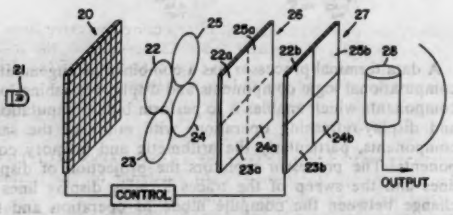
Filed Dec. 30, 1969, Ser. No. 889,024
Int. Cl. G06c *15/00*
U.S. Cl. 340—172.5 **4 Claims**



An improved method and means to implement a logic function F of N variables by partitioning the logic operation in a plurality of generalized logic matrices. It is first mathematically demonstrated that a function F of N variables may be expanded into subfunctions of a lesser number of variables. These subfunctions may be logically implemented individually and then logically combined so as to produce the desired function of N variables with a concomitant savings in logic circuitry over that required if the functions were

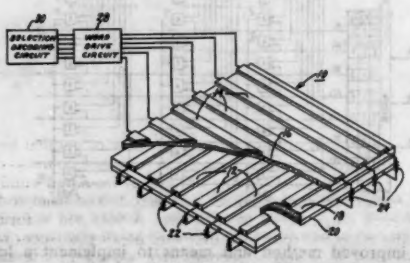
directly implemented. The means used to implement the logic function F are a plurality of generalized logic matrices, each of which comprises a plurality of logic gates arranged in columns and rows, an input decoder for accepting the input variables, and a storage register for varying the functions generated at the output of the matrix. These matrices are arranged in cascade so that, as the function F is constructed from the several subfunctions, additional variables are inserted at each matrix stage until the function F of N variables is fully generated.

3,593,318
OPTICAL MEMORY
Iben Browning, 745 Distel Drive, Los Altas, Calif.
Filed Feb. 26, 1968, Ser. No. 708,061
Int. Cl. G11c *11/22, 11/42*
U.S. Cl. 340—173 **2 Claims**



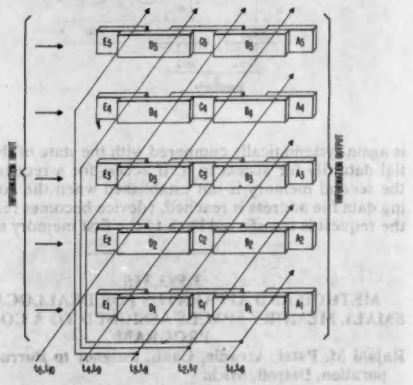
An optically interrogated information storage and retrieval device is disclosed wherein light is modulated by a light shutter array comprising a polycrystalline ferroelectric ceramic lattice and focused on a photographic film to produce an image corresponding to the configuration of light-transmitting portions of the ceramic lattice. A lens mosaic may be used to focus light transmitted by the ferroelectric ceramic lattice to a plurality of nonoverlapping regions of the photographic film to produce in combination extremely high information bit density. A laser beam may be used for the light source and an energy-absorbing coating for the information storage medium to provide a high density mass memory.

3,593,319
CARD-CHANGEABLE CAPACITOR READ-ONLY MEMORY
William D. Barber, Schenectady, N.Y., assignor to General Electric Company
Filed Dec. 23, 1968, Ser. No. 786,269
Int. Cl. G11c *17/00*
U.S. Cl. 340—173 SP **6 Claims**



A low cost read-only capacitive storage memory is described wherein the word lines and bit lines of the read matrix are formed as a plurality of straight conductors orthogonally disposed on opposite sides of an insulating layer. To encode the read matrix, a printed circuit card having conductive platelets selectively positioned thereon is disposed conductor-side downward atop the matrix with the platelets in registration with selective crossover areas of the word and bit lines and readout is effected by a measurement of the electrical signal capacitively coupled from a driven word line to the bit lines. Preferably the platelets are formed as orthogonal crosses vacuum deposited atop a flexible substrate to permit contouring of the platelets for maximum capacitive coupling between the word and bit lines.

3,593,320
FIRST-IN, FIRST-OUT DATA BUFFER MEMORY
John D. Blades, Wayne, Pa., assignor to Burroughs Corporation, Detroit, Mich.
Filed Feb. 14, 1968, Ser. No. 705,480
Int. Cl. G11c *5/08, 11/14, 19/00*
U.S. Cl. 340—174 TF **9 Claims**

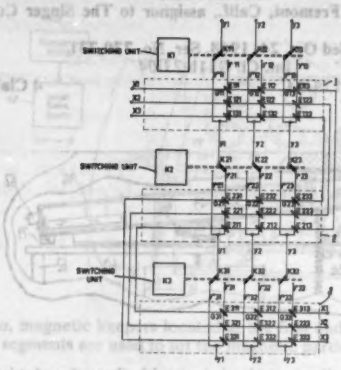


The present application discloses a data buffer memory system which receives information into one end and immediately propagates the information through the memory to its farthest coupled element. It thus provides the information at its output end in the same sequence as it was received. The key to the proposed memory system is a coupling/no coupling condition that can exist between two diplanar ferromagnetic thin films separated by a nonmagnetic conductive material. It is possible to fabricate the proposed memory matrix systems by multiple deposition techniques. High bit density may be achieved by standard or improved etching procedures.

3,593,321
MATRIX STORAGE
Wolfgang Kraft, Bad Hersfeld, Germany, assignor to Zuse K.G., Bad Hersfeld, Germany
Filed Apr. 29, 1968, Ser. No. 725,235
Claims priority, application Germany, Apr. 29, 1967, June 23, 1967, Z 12823;Z 12913
Int. Cl. G11c *7/02, 11/06*
U.S. Cl. 340—174 **12 Claims**

A group of rows repeatedly intersects a group of columns. Switchable elements are placed at each intersection of a row and a column which are switched from a first state to a second state if a signal is present in both the intersecting row and column. All elements at intersection points created by the first intersection of the group of rows with the group of columns belong to a first information plane, all elements at intersections corresponding to the second intersection of said group of rows with the columns correspond to a second information plane, etc. A shunt wire is provided for each group of elements in any one column in any information plane, and switching elements select either the shunt wire or the corresponding group of elements. Individual driving circuits may be provided for each row and each column, or a number of columns may be connected together to form a column group

connected to a single column driving circuit. Switching units are provided for jointly operating all switching elements in



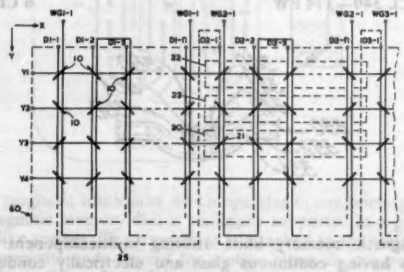
any one information plane, which belong to different column groups.

3,593,322

A SEQUENTIAL ADDRESS MAGNETIC MEMORY SYSTEM

David Joseph Morris, Holon, Israel, assignor to English Electric Computers Limited, London, England

Filed Apr. 23, 1968, Ser. No. 728,380
Claims priority, application Great Britain, May 2, 1967, 20182/67
Int. Cl. G11c *5/08, 7/02, 5/02*
U.S. Cl. 340—174 M **4 Claims**



This invention relates to a magnetic core store with coincident current selection. In such a store, the readout of successive words in sequential addresses involves the selection of each word in turn. By the present invention, such successive reading out of words in a block is achieved by energizing that selection line which is common to the block continuously, and pulse energizing the other selection lines in succession. Thus, for the first word, noise is produced on the sense lines by both selection lines, but for the remaining words the only noise is that due to the selection lines individual to the successive words being read out. Preferably, the store is arranged so that this latter noise is small compared with the noise produced on normal full selection of a word. A more rapid readout of the block is thereby achieved.

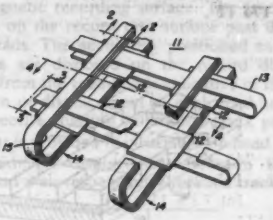
3,593,323

MAGNETIC MEMORY MATRIX WITH KEEPERS

Shunichi Suzuki, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Nov. 13, 1968, Ser. No. 775,331
Claims priority, application Japan, Nov. 17, 1967, 42/74021
Int. Cl. G11c *5/02, 11/14*
U.S. Cl. 340—174 BC **2 Claims**

A magnetic memory matrix including magnetic memory elements spaced in parallel rows and columns, drive lines disposed over the memory element rows for selectively actuating the memory elements in memory information operations, information and readout lines disposed over the



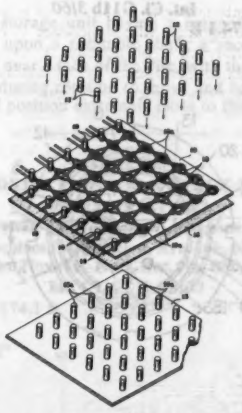
memory element columns and intersecting the drive lines at right angles, and magnetic keepers disposed over the information and readout lines to overlie crossovers of the drive lines and the information and readout lines.

3,593,324

ROD MEMORY SOLENOID WEAVING CONSTRUCTION

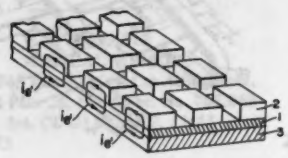
Donal A. Meier, Inglewood, Calif., assignor to The National Cash Register Company, Dayton, Ohio

Division of Ser. No. 477,794, Aug. 6, 1965, Pat. No. 3,440,719.
This application Dec. 23, 1968, Ser. No. 786,224
Int. Cl. G11c *11/04, 11/14, 5/02*
U.S. Cl. 340—174 WC **9 Claims**



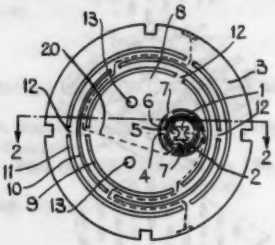
A memory array comprised of a plurality of parallel bistable magnetic rods, arranged upright in rows and columns of a plane, and a solenoid weaving pattern of insulated conductive wires woven perpendicular to the rods and from rod to rod of each column and of each row. A solenoid is formed about the magnetic rods by a first wire passing adjacent rods on opposite sides and a second wire woven in the same manner as the first, except that it passes by each rod on the opposite side of the first. A plurality of first coordinate drives are formed by the solenoid wires woven about the rows of rods and a plurality of second coordinate drives are formed by the solenoid wires woven about the columns of rods, so that a different combination of first and second coordinate drives is formed by the solenoid weaving pattern for each rod.

3,593,325
MAGNETIC THIN FILM STORAGE DEVICE FOR NONDESTRUCTIVE READOUT THEREOF
Gunter Salzmann, Dresden, Germany, assignor to Institut Fur Elektronik Dresden, Dresden, Germany
Filed Jan. 15, 1969, Ser. No. 791,466
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF 10 Claims



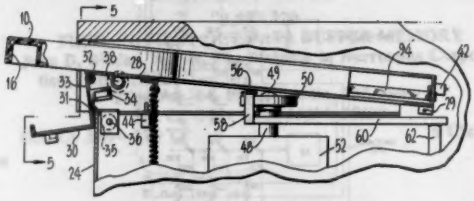
A magnetic thin film device susceptible to the influence of an external magnetic pulse field comprises an anisotropic magnetic storage film having a pair of spaced surfaces and a pair of electrical conductors each in electrical contact with and next adjacent a corresponding one of the surfaces of the film.

3,593,326
MAGNETIC HEAD MOUNTING WITH PLURAL GIMBALS
Ian Turner, Martins Wood, Stevenage, Hertfordshire, and Peter George Jackaman, Trotts Hill, Stevenage, Hertfordshire, both of, England, assignors to International Computers Limited, London, England
Filed July 7, 1969, Ser. No. 839,150
Claims priority, application Great Britain, July 9, 1968, 32714/68
Int. Cl. G11b *5/60*
U.S. Cl. 340—174.1 E 6 Claims



A gimbal mounting for a magnetic head is disclosed which is constructed of a sheet of resilient material which has apertures therein defining a first gimbal supporting an intermediate area within an outer area of the sheet and further apertures defining a second gimbal supporting an inner area of the sheet within the intermediate area. The outer area is secured to a support member and a magnetic head is secured to the inner area. The intermediate area also carries a pair of skids, or alternatively a pair of further gimballed inner areas to which magnetic heads are secured. The skids and head, or the three heads form, in cooperation with a record surface form, a three-point suspension for the intermediate area. The first gimbal ensures that the three-point suspension is able to follow relatively slow surface changes of the record whilst the second gimbal supporting the inner area permits the head to be closely in contact with the record surface in spite of relatively rapid surface changes.

3,593,327
MEMORY-DISC CARTRIDGE WITH LOADING MECHANISM
Karl E. Shill, Fremont, Calif., assignor to The Singer Company
Filed Oct. 24, 1968, Ser. No. 770,231
Int. Cl. G11b *23/04*
U.S. Cl. 340—174.1 C 4 Claims



A magnetic disc cartridge is insertable through a slot into a drive housing. Such insertion opens a shutter in the cartridge and unlocks a lowering mechanism. Closing of a door to the slot lowers the cartridge to set the memory disc onto a drive spindle where it is held magnetically. Operation of the drive mechanism then locks the door closed and locks the cartridge down.

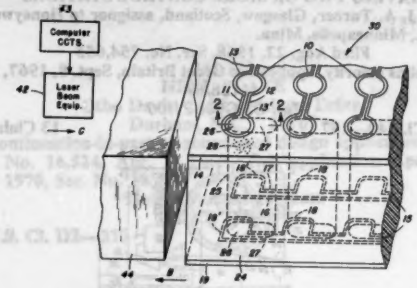
3,593,328
MULTICOMPONENT PLATED GLASS FIBER MAGNETIC MEMORY
William C. Trethewey, Newark, Ohio, assignor to Owens-Corning Fibreglas Corporation
Continuation of application Ser. No. 589,410, Oct. 25, 1966, now abandoned. This application Oct. 20, 1969, Ser. No. 867,961
Int. Cl. G11c *5/02, 11/04, 11/14*
U.S. Cl. 340—174 PW 6 Claims

Magnetic memory units utilizing multicomponent glass fibers having continuous glass and electrically conductive and/or magnetic components in the fibers, for arrangement in a memory unit array. Novel multicomponent glass fibers and strands are also disclosed.

3,593,329
SEMIPERMANENT MAGNETIC STORAGE EMBODYING GROUPS OF MAGNETIC PARTICLES COLLECTABLE AS DISCRETE UNITS IN SEPARATE AREAS AT WORD AND OUTPUT LINE INTERSECTIONS TO STORE BINARY SIGNALS
Shunichi Suzuki, Tokyo-to, Japan, assignor to Nippon Electric Company, Limited, Tokyo-to, Japan
Filed Oct. 29, 1969, Ser. No. 872,268
Int. Cl. G11b *5/14*
U.S. Cl. 340—174 M 18 Claims

A semipermanent magnetic matrix comprising intersecting word and output lines, a dielectric interposed between the lines and formed with openings, each having a first segment disposed between the lines at each line intersection and a second segment laterally disposed from each line intersecting and a magnetic mixture including groups of magnetic particles and an inert substance placed in each opening, whereby its respective particle groups are activated into unitary structures in preselected first and second opening segments at given times to store "0" and "1" binary signals. The inert

substance may comprise commercial paraffin changeable into liquid and solid states, or ambient air or silicone oil.



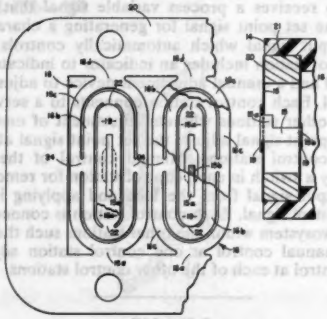
Also, magnetic keepers located at the first and second opening segments are used to set the magnetic particle structures.

3,593,330

WEB-LIKE SPRING SUPPORT FOR MAGNETIC TRANSDUCER

Donald M. Ackley, Torrance, Calif., assignor to Computer Communications, Inc.

Filed Jan. 27, 1969, Ser. No. 794,144
Int. Cl. G11b *5/60*
U.S. Cl. 340—174.1 **8 Claims**



A magnetic transducer which operates in conjunction with a magnetic memory disc is resiliently supported in a pair of weblike springs. The transducer is attached to the springs at the opposite ends thereof for motion along an axis perpendicular to the surface of the magnetic memory disc.

3,593,331

MAGNETIC DISC CALIBRATION TRACK WITH DIMINISHING APERTURES

Kenneth P. Connell, Los Angeles, and Joseph J. Bourdon, Inglewood, both of, Calif., assignors to The National Cash Register Company, Dayton, Ohio

Filed Jan. 31, 1969, Ser. No. 795,416
Int. Cl. G11b *5/56*
U.S. Cl. 340—174.1 C **13 Claims**

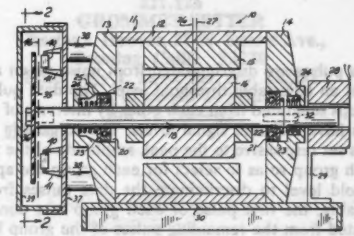
Apparatus used to align a multiple head unit mounted in a disc file of a magnetic disc memory system. The multiple head unit supports a plurality of magnetic read/write heads in close proximity to a surface of an interchangeable record disc having a magnetic recording surface on a nonmagnetic substrate. A calibration track pattern is formed on the record disc for each read-head by exposing defined areas of the nonmagnetic substrate through the magnetic recording surface. The track patterns are rotated on the record disc surface past their respective read-heads. The accurately positioned calibration track patterns are disposed on the record disc to provide signals from the read-heads indicative of the amount and direction of displacement of each read-head relative to its respective rotating calibration track pattern. An adjustment is provided for the multiple head unit to reduce the maximum displacement between the read/write heads and their respective calibration track patterns.

3,593,332

MAGNETIC DISC MEMORY STORAGE UNIT

Gerald K. Strehl, Pontiac, and Walter J. Fitzgibbons, Southfield, both of, Mich., assignors to Information Data Systems, Incorporated, Detroit, Mich.

Filed May 13, 1969, Ser. No. 824,117
Int. Cl. G11b *5/10, 5/60*
U.S. Cl. 340—174.1 **6 Claims**



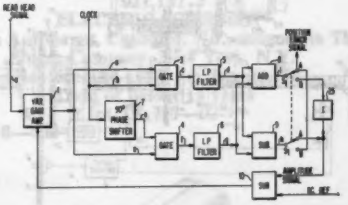
A memory storage unit having a magnetic-type memory disc mounted upon a rotatable shaft, a recording-receiving head mounted near a face of the disc, with the shaft being axially shiftable during rotation to move and hold the disc to a predetermined position extremely close to the head.

3,593,333

POSITION DETECTION FOR A TRACK FOLLOWING SERVO SYSTEM

Richard K. Oswald, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,274
Int. Cl. G11b *21/10*
U.S. Cl. 340—174.1 B **3 Claims**



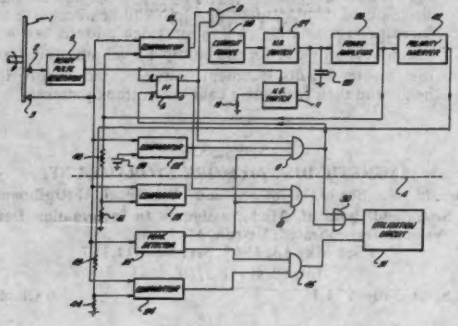
The invention relates to the positioning of a transducer relative to a desired information track on a magnetic disc. Alternate reference tracks on the disc are 90° out of phase with each other. Position error detection circuitry derives an error position signal and an automatic gain signal simultaneously from the signal induced in the transducer as a function of its position relative to the reference tracks on the disc. The automatic gain signal is provided even when the transducer is properly placed and allows for more accurate error position signals to be generated by the position error detection circuitry.

3,593,334

PULSE DISCRIMINATION SYSTEM

Charles E. Bickel, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 29, 1968, Ser. No. 779,802
Int. Cl. G11b 5/44; H03k 5/20
U.S. Cl. 340—174.1 H 20 Claims



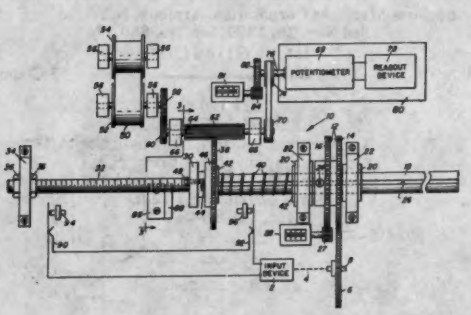
Data pulses are discriminated from noise on an amplitude basis at an adjustable threshold level. The data pulses occur in groups separated from each other by intervals of time. The groups have different signal levels. The adjustable threshold level is set responsive to the peak amplitude of the first pulse of each group so as to select for each group the appropriate threshold level to discriminate the data pulses from noise. Preferably, the first pulse of each group is a control pulse separated from the remaining pulses of the group by several bit cells.

3,593,335

PARTIAL-RANGE TRACKING INDICATOR

Harold O. Wires, and Samuel E. Rickly, both of Columbus, Ohio, assignors to The United States of America as represented by the Secretary of the Interior

Filed May 16, 1969, Ser. No. 825,349
Int. Cl. G01d 5/04
U.S. Cl. 340—177 7 Claims



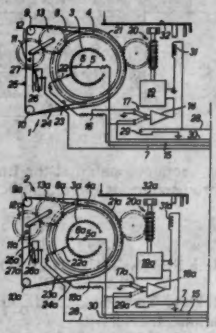
A first mechanical system monitors the total displacement of an element within an input device. A second mechanical system monitors only a critical increment of that displacement. The first system activates and deactivates the second system at the boundary of the critical increment. The second system operates an electromechanical readout transducer. In this way the readout resolution of the transducer is increased for the displacement increment of critical concern.

3,593,336

TANDEM CONTROL OF PROCESS CONTROLS SYSTEM HAVING TWO OR MORE CONTROL STATIONS

Peter J. A. Turner, Glasgow, Scotland, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 22, 1968, Ser. No. 754,655
Claims priority, application Great Britain, Sept. 8, 1967, 41128/67
Int. Cl. G08c 21/00
U.S. Cl. 340—187 13 Claims



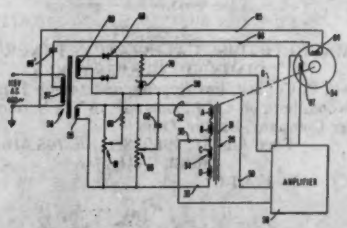
A process control system having two or more control stations is shown wherein each control station generates a set point signal which is applied to a control device. The control device also receives a process variable signal that is compared to the set point signal for generating a characterized system output signal which automatically controls a load. Each control station includes an indicator to indicate the set point signal and a manual adjustment device to adjust the set point signal. Each control station connects to a servosystem within the other stations wherein adjustment of one control station set point signal adjusts the set point signal at each of the other control stations. Manual control of the load is achieved by a switch in each control station for removing the system output signal from the load and applying instead a manual control signal. Each control station is connected to a further servosystem within the other stations such that adjustment of manual control at one control station adjusts the manual control at each of the other control stations.

3,593,337

ELECTROMECHANICAL TRANSDUCER

Victor D. Ellison, Waverly, Pa., assignor to The Bendix Corporation

Filed Aug. 23, 1968, Ser. No. 754,896
Int. Cl. G08c 19/08
U.S. Cl. 340—187 13 Claims



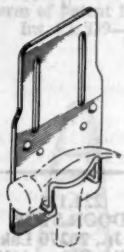
A motion detecting device for sensing the direction and magnitude of such motion in the form of a sealed electromechanical transducer including a highly sensitive synchro having a rotor comprising magnetic flux conducting material and a rotatably stator with a plurality of series connected primary windings energized by an AC source of electrical energy and servoed in response to the electrical output thereof, as determined by the rotor position, to follow movements of the rotor relative to the stator and thereby reestablish a null or zero output relationship of the stator and the rotor, said output being a result of variations in the impedance of the windings when the rotor is displaced from a predetermined null or zero output position relative to the stator.

DESIGNS

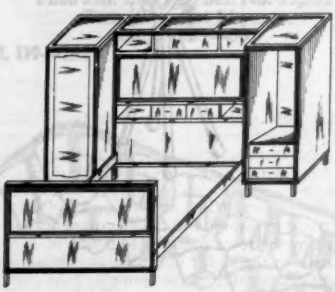
JULY 13, 1971

221,122
HEEL PLATE
Otho Davis, 214 Landsburg Drive, Durham, N.C. 27707
Continuation-in-part of abandoned design application Ser. No. 16,524, Apr. 1, 1969. This application Apr. 21, 1970, Ser. No. 22,548
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—317

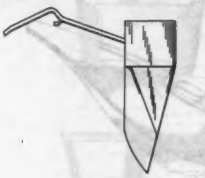
221,123
BELT ATTACHED TOOL HOLDER
William H. Nicholas, 5225 W. 2nd St., Los Angeles, Calif. 90004
Filed Feb. 2, 1970, Ser. No. 21,182
Term of patent 14 years
Int. Cl. D2—*08*
U.S. Cl. D2—400



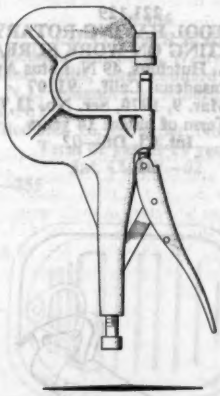
221,124
COMBINED BEDSTEAD AND CABINET OR SIMILAR ARTICLE
Giuseppe Coluccio, 2610 Ave. U. New York, N.Y. 11229
Filed July 30, 1969, Ser. No. 18,471
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D5—4



221,125
COMBINED CAN OPENER AND CLOSURE
Loran L. Laughlin, 2541 Maywood Drive, Salt Lake City, Utah 84109
Filed June 11, 1970, Ser. No. 23,440
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—34



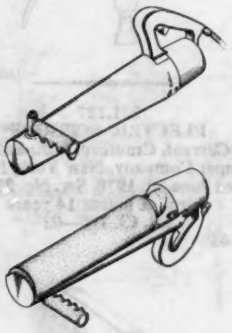
221,126
GROMMET SETTER
Charles I. Hoover, 98 N. Sunset Ave., Banning, Calif. 92220
Filed May 1, 1970, Ser. No. 22,751
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51



221,127
ELECTRIC SCISSORS
Wayne A. Current, Cranford, N.J., assignor to The Singer Company, New York, N.Y.
Filed June 30, 1970, Ser. No. 23,770
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—61

221,128
ELECTRIC SCISSORS
Wayne A. Current, Cranford, N.J., assignor to The Singer Company, New York, N.Y.
Filed June 30, 1970, Ser. No. 23,771
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—61

221,129
PORTABLE TOOL HAVING ROTARY DRUM FOR ACTING ON WORK SURFACE
Alma A. Hutchins, 49 N. Lotus Ave., Pasadena, Calif. 91107
Filed Mar. 9, 1970, Ser. No. 21,792
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—62



221,130
DOOR MOUNTED PROTECTION UNIT
Harry R. Gewertz, Whittier, and Henry R. Escalette, Villa Park, Calif., assignors to Ajax Hardware Manufacturing Corporation, City of Industry, Calif.
Filed Apr. 1, 1970, Ser. No. 22,193
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—177

221,131
DOOR STOP
John Germock, Jr., 20270 Lake Shore Blvd., Euclid, Ohio 44123
Filed Nov. 19, 1969, Ser. No. 20,170
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—204

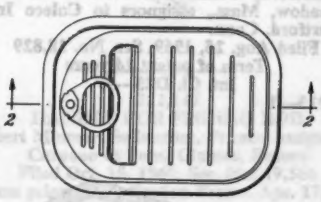
221,132
SQUEEZE BOTTLE
Sebastian J. Schiavone, 24 Merrit Ave., East Chester, N.Y. 10709
Filed Apr. 14, 1970, Ser. No. 22,499
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—2

221,133
BOTTLE OR SIMILAR ARTICLE
Bendt Wikke, deceased, late of Copenhagen, Denmark, by Skifteretten I. Lyngby (the Probate Court) Lyngby, Denmark, assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Jan. 8, 1970, Ser. No. 20,829
Claims priority, application Denmark July 9, 1969
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—45

221,134
EGG TRAY
Clifford H. Bessett, South Holland, Ill., assignor to Packaging Corporation of America, Evanston, Ill.
Filed Jan. 17, 1969, Ser. No. 15,391
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—190

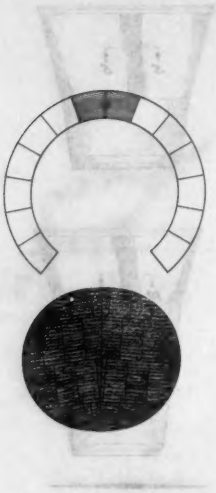
221,135
TUMBLER
Roland Thomas Schorer, Palos Verdes, Calif., and Morison S. Cousins, Plainview, N.Y., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Apr. 23, 1970, Ser. No. 22,608
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D9—220

221,136
CONTAINER END
Raymond Luscombe Batchelar, Westwood, Carl William Heinle, Short Hills, and Leonard Thomas Lacroce, Paramus, N.J., assignors to American Can Company, New York, N.Y.
Filed Jan. 16, 1970, Ser. No. 20,947
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D9—255

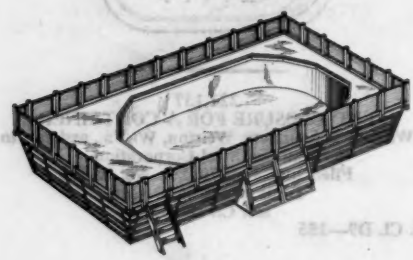


221,137
END CLOSURE FOR A CONTAINER
William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation
Filed June 1, 1970, Ser. No. 23,238
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D9—255

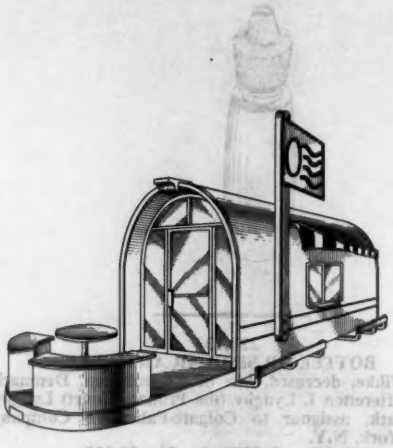
221,138
ORNAMENTAL AIRPORT FLOORING
Lawrence G. Barrett, Lynchburg, Va., assignor to The American Novawood Corporation, Lynchburg, Va.
Filed Nov. 15, 1968, Ser. No. 14,489
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1



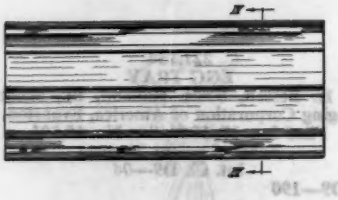
221,139
COMBINED SWIMMING POOL AND ENCLOSURE
Joseph Diemond, Simsbury, and Melvin Y. Gershman, West Hartford, Conn., and Norbert A. Vangsness, Longmeadow, Mass., assignors to Coleco Industries, Inc., Hartford, Conn.
Filed Aug. 25, 1969, Ser. No. 18,829
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1



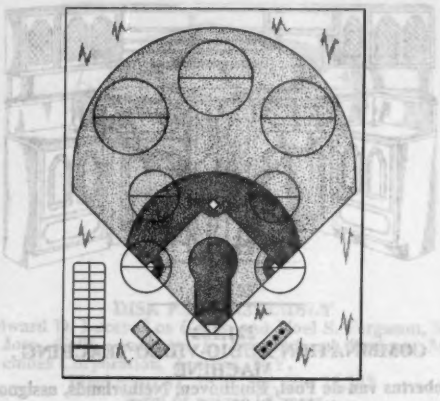
221,140
BUILDING
Mark A. Wood, 1913 E. 116th St., Carmel, Ind. 46032
Filed Nov. 12, 1969, Ser. No. 20,041
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



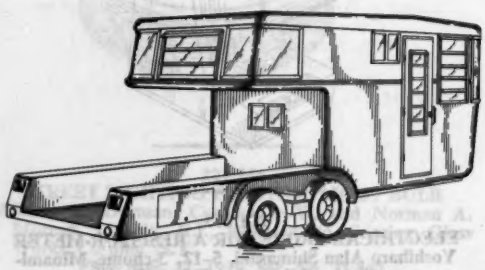
221,141
MOBILE HOME DECORATIVE MOLDING
Robert S. Wormser, Hillsdale, Mich., assignor to Game Time, Inc., Litchfield, Mich.
Filed Mar. 19, 1970, Ser. No. 21,982
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6



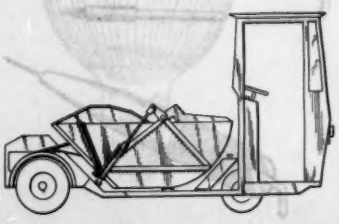
221,142
BASEBALL GAME BOARD
Paul Posnick, 330 E. 79th St., New York, N.Y. 10021
Filed Jan. 19, 1970, Ser. No. 20,991
Term of patent 1 4years
Int. Cl. D21—*01*
U.S. Cl. D34—5



221,143
COMBINED CAMPING AND HAULING VEHICLE
George Gordon Davis, Elkhart, Ind., assignor to Trans-Por-Teer Corporation
Filed Feb. 17, 1970, Ser. No. 21,472
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D14—3



221,144
REFUSE COLLECTION VEHICLE
John W. Knight, Sr., New Hampton, Iowa, assignor to Sani-Systems, Inc., New Hampton, Iowa
Filed Mar. 30, 1970, Ser. No. 22,103
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—3



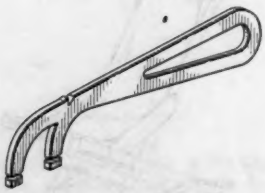
221,145
BRAKE SHOE
Hugh G. Margetts, Leamington Spa, and Gordon A. Habgood, Shipston-on-Stour, England, assignors to Girling Limited, Tyseley, England
Filed Aug. 11, 1969, Ser. No. 18,613
Claims priority, application Great Britain Feb. 27, 1969
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—30

221,146
FOLDABLE LAWN CHAIR
Charles W. McComas, 116 S. Delaware St., Hobart, Ind. 46342
Filed Feb. 2, 1970, Ser. No. 21,180
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—1

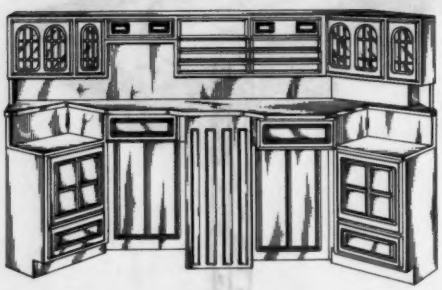
221,147
HANDLE FOR FISHING ROD
Robert Mimeur, Sallanches, France, assignor to Carpano et Pons, Clauses, France
Filed Oct. 15, 1969, Ser. No. 19,566
Claims priority, application France Apr. 17, 1969
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

221,148
AIR CONDITIONER CASING
Arthur P. Cary, Dallas, Tex., assignor to The Cary Products Co. Inc., Hutchins, Tex.
Filed Nov. 19, 1969, Ser. No. 20,172
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—142

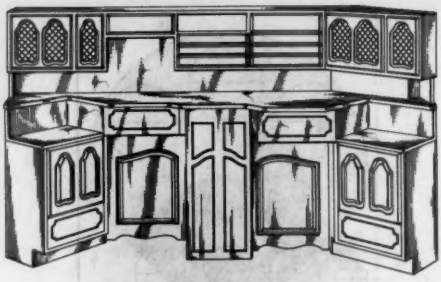
221,149
DENTAL FLOSS HOLDER
Hal E. Davis, R.R. 1, Fairfax, Mo. 64446
Filed Jan. 12, 1970, Ser. No. 20,892
Term of patent 14 years
Int. Cl. D24—*99;* D28—*01*
U.S. Cl. D24—1



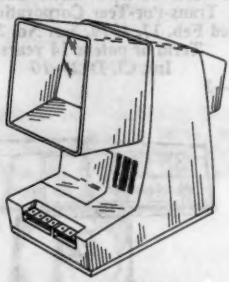
221,150
DENTAL CABINET OR THE LIKE
Kenneth R. Ferguson, Jr., Charlotte, N.C., assignor to Pelton & Crane Company, Charlotte, N.C.
Filed June 12, 1970, Ser. No. 23,448
Term of patent 14 years
Int. Cl. D24—*03;* D6—*01*
U.S. Cl. D24—1



221,151
DENTAL CABINET OR THE LIKE
Kenneth R. Ferguson, Jr., Charlotte, N.C., assignor to Pelton & Crane Company, Charlotte, N.C.
Filed June 12, 1970, Ser. No. 23,450
Term of patent 14 years
Int. Cl. D24—*02;* D6—*01*
U.S. Cl. D24—1

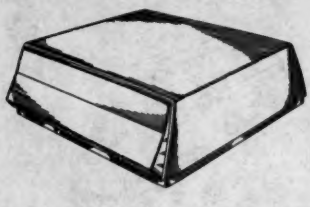


221,152
COMBINATION AUDIO-VIDEO TEACHING MACHINE
Rebertus van de Poel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation
Filed July 1, 1969, Ser. No. 18,011
Claims priority, application Switzerland Jan. 7, 1969
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D25—1

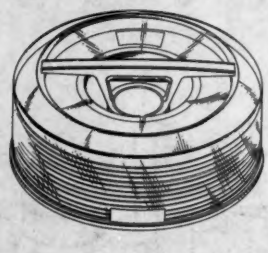


221,153
ELECTRICAL PROBE FOR A RESISTOR-METER
Yoshiharu Alan Shimasaki, 5–12, 3-chome, Minami-Azabu, Minato-ku, Tokyo, Japan
Filed Feb. 28, 1968, Ser. No. 10,765
Claims priority, application Japan Aug. 31, 1967
Term of patent 14 years
Int. Cl. D10—*10*
U.S. Cl. D26—1

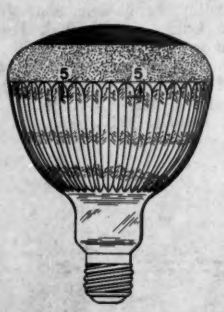
221,154
DATA SET
George M. Janda, Westchester, Ill., assignor to GTE Automatic Electric Laboratories Incorporated
Filed Jan. 9, 1970, Ser. No. 20,848
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



221,155
DISK PACK ASSEMBLY
Edward D. Lucey, Los Gatos, and Noel S. Ferguson, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 31, 1970, Ser. No. 22,142
Term of patent 14 years
Int. Cl. D14—*02*; D9—*04*
U.S. Cl. D26—5



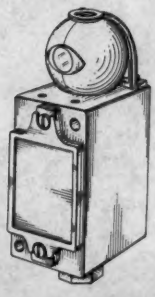
221,156
STREET LIGHTING ELECTRIC LIGHT BULB
William H. Dorman, Corning, N.Y., and Norman A. Moreau, Lincoln, R.I., assignors to Corning Glass Works, Corning, N.Y.
Filed Mar. 11, 1970, Ser. No. 21,857
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D26—8



221,157
STREET LIGHTING ELECTRIC LIGHT BULB
William H. Dorman, Corning, N.Y., and Norman A. Moreau, Lincoln, R.I., assignors to Corning Glass Works, Corning, N.Y.
Filed Mar. 11, 1970, Ser. No. 21,858
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D26—8

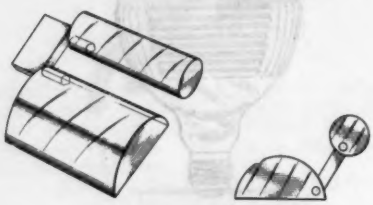
221,158
STREET LIGHTING ELECTRIC LIGHT BULB
William H. Dorman, Corning, N.Y., and Norman A. Moreau, Lincoln, R.I., assignors to Corning Glass Works, Corning, N.Y.
Filed Mar. 11, 1970, Ser. No. 21,859
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D26—8

221,159
LIGHT-OPERATED SWITCH HOUSING
Clifford E. Myers, Forest Grove, Oreg., assignor to The Welsh Corporation, Longview, Wash.
Filed Apr. 20, 1970, Ser. No. 22,506
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



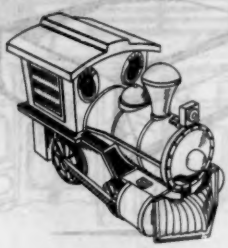
221,160
CABINET DOOR
Nicholas A. Ungaro, Louisville, Ky., assignor to H. J. Scheirich Company
Filed June 19, 1969, Ser. No. 17,785
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—1

221,161
MAGNIFYING DEVICE
Robert Dwight Lynch, 3520 5th Ave., Los Angeles, Calif. 90018
Filed Dec. 29, 1969, Ser. No. 20,681
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D57—1

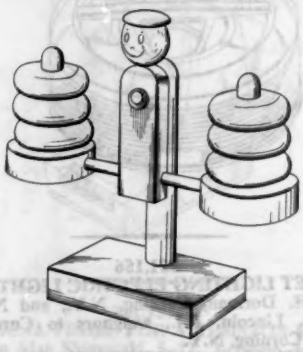


221,162
PLAYGROUND ROUNDABOUT
Robert S. Wormser, Hillsdale, Mich., assignor to Game Time, Inc., Litchfield, Mich.
Filed Mar. 19, 1970, Ser. No. 21,981
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5

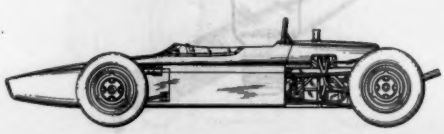
221,163
TOY RAILWAY ENGINE
Duncan Tong, 423 Central Building, 3 Pedder St., Hong Kong
Filed Nov. 14, 1969, Ser. No. 20,083
Claims priority, application Great Britain Aug. 28, 1969
Term of patent 3½ years
Int. Cl. D21—*02*
U.S. Cl. D34—15



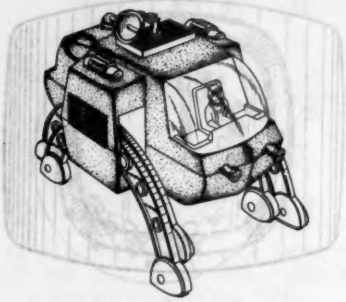
221,164
EDUCATIONAL TOY SCALE
John Joslyn, Sag Harbor, N.Y., assignor to Playskool, Inc., Chicago, Ill.
Filed Nov. 24, 1969, Ser. No. 20,251
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



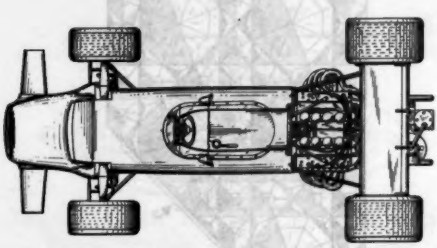
221,165
MODEL RACING CAR
Eric Harrison Broadley, Pangborne, near Reading, England, assignor to Lola Cars Limited, Trading Estate, Slaigh, Buckinghamshire, England
Filed Mar. 31, 1970, Ser. No. 22,140
Claims priority, application Great Britain Oct. 2, 1969
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



221,166
WALKING SPACE VEHICLE TOY
Arthur R. Gorfain, Fair Lawn, N.J., assignor to Cragstan Industries, Inc., New York, N.Y.
Filed Apr. 15, 1970, Ser. No. 22,432
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

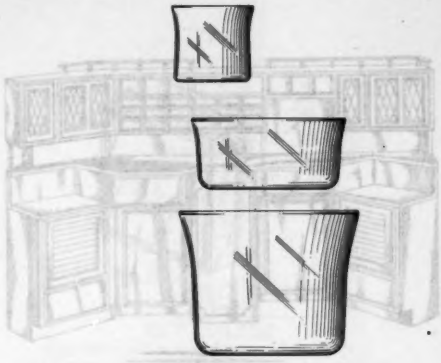


221,167
MODEL RACING CAR
Ronald Sidney Tauranac, Weybridge, England, assignor to Motor Racing Developments Limited, Weybridge, England
Filed June 10, 1970, Ser. No. 23,415
Claims priority, application Great Britain Dec. 10, 1969
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

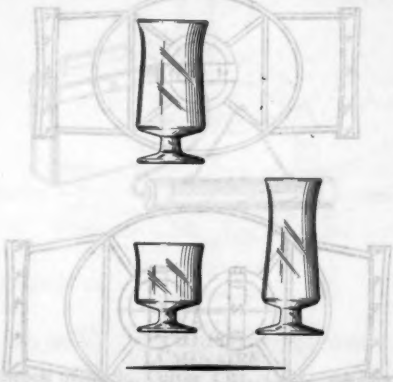


221,168
PITCHER OR SIMILAR ARTICLE
Frank J. Benes, Lancaster, Ohio, assignor to Ravenscroft Ltd., Lancaster, Ohio
Filed May 6, 1970, Ser. No. 22,834
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D36—2

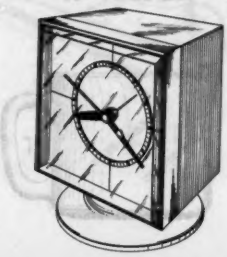
221,169
BOWL OR SIMILAR ARTICLE
Frank J. Benes, Lancaster, Ohio, assignor to Ravenscroft Ltd., Lancaster, Ohio
Filed May 6, 1970, Ser. No. 22,836
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D36—2



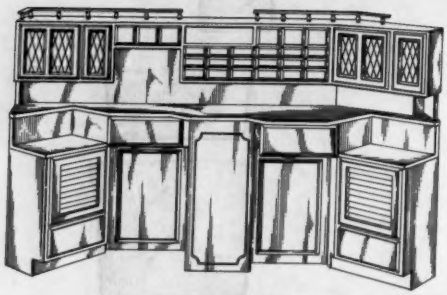
221,170
GOBLET OR SIMILAR ARTICLE
Frank J. Benes, Lancaster, Ohio, assignor to Ravenscroft Ltd., Lancaster, Ohio
Term of patent 14 years
Filed May 6, 1970, Ser. No. 22,835
Int. Cl. D7—*01*
U.S. Cl. D36—8



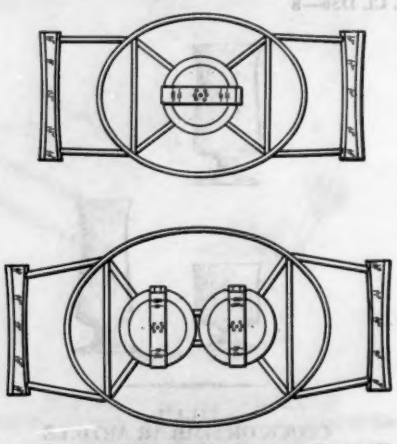
221,171
CLOCK OR SIMILAR ARTICLE
Walter C. Anderson, Redding, Conn., assignor to General Electric Company
Filed June 12, 1970, Ser. No. 23,457
Term of patent 7 years
Int. Cl. D10—*01*
U.S. Cl. D42—7



221,172
DENTAL CABINET OR THE LIKE
Kenneth R. Ferguson, Jr., Charlotte, N.C., assignor to Pelton & Crane Company, Charlotte, N.C.
Filed June 12, 1970, Ser. No. 23,451
Term of patent 14 years
Int. Cl. D24—*03*; D6—*01*
U.S. Cl. D24—1

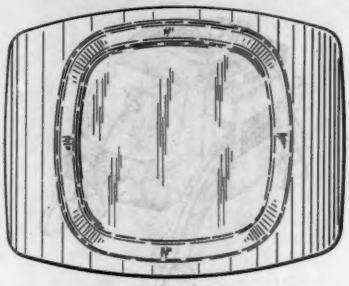


221,173
DISH WARMING STAND OR SIMILAR ARTICLE
Glenn B. Beckman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Apr. 27, 1970, Ser. No. 22,667
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D44—10

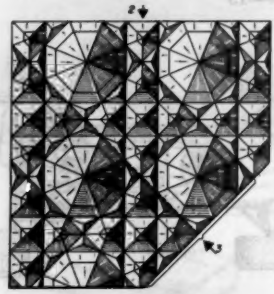


221,174
CUP OR SIMILAR ARTICLE
Frank J. Benes, Lancaster, Ohio, assignor to Ravenscroft Ltd., Lancaster, Ohio
Filed May 6, 1970, Ser. No. 22,832
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—9

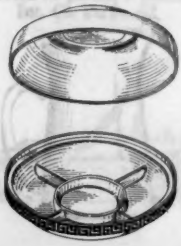
221,175
SUPPORTING CRADLE FOR A SERVING DISH OR THE LIKE
Glenn B. Beckman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Apr. 27, 1970, Ser. No. 22,674
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—10



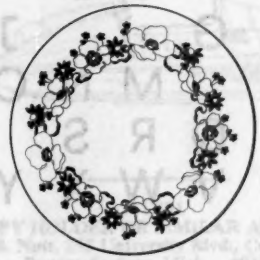
221,176
TRANSPARENT COVERING PANEL FOR LIGHT FITTINGS
Friedrich Clostermann, Hagen, Germany, assignor to Trilux-Lenze KG, Neheim-Husten, Germany
Filed July 11, 1969, Ser. No. 18,174
Claims priority, application Germany Jan. 15, 1969
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—16



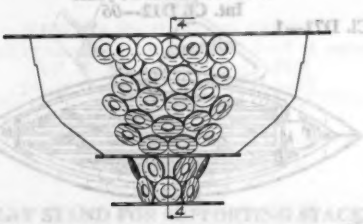
221,177
BOWL
George C. Wong, 1061 Caldwell Ave., Port Credit, Ontario, Canada
Filed Mar. 26, 1970, Ser. No. 22,067
Claims priority, application Canada Oct. 2, 1969
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15



221,178
PLATE OR THE LIKE
Cynthia S. Gerow, Syracuse, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed May 12, 1970, Ser. No. 22,938
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15



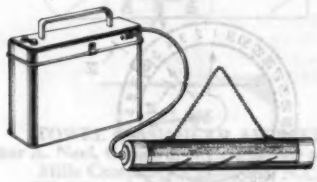
221,179
BOWL
Marcel Paquette, 393 Crestwood Drive, Cheshire, Conn. 06410
Filed May 27, 1970, Ser. No. 23,165
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15



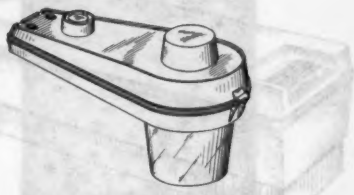
221,180
ELECTRIC FONDUE POT OR THE LIKE
Alfred W. Madl, Glendale, Wis., assignor to John Oster Manufacturing Co., Milwaukee, Wis.
Filed May 28, 1970, Ser. No. 23,186
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—15

221,181
LUMINAIRE
Mitchell Bobrick, Culver City, Calif., assignor to Holophane Company, Inc., New York, N.Y.
Filed Oct. 24, 1969, Ser. No. 19,707
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—4

221,182
COMBINED PORTABLE LIGHT OR SIMILAR ARTICLE AND POWER PACK THEREFOR
Walter P. Hilgendorf, El Paso County, Colo. (529 S. 31st St., Colorado Springs, Colo. 80904)
Filed Nov. 21, 1969, Ser. No. 20,213
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D48—24



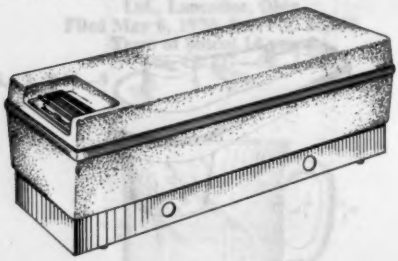
221,183
LUMINAIRE
Mitchell Bobrick, Culver City, Calif., assignor to Holophane Company, Inc., New York, N.Y.
Filed Oct. 23, 1969, Ser. No. 19,690
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



221,184
VENDING MACHINE
Wayne C. Cathey, Dallas, Tex., assignor to Burger Chef Systems, Inc., Indianapolis, Ind.
Filed Apr. 7, 1970, Ser. No. 22,310
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3

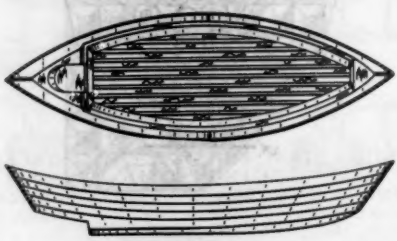
221,185
MENSUAL CALCULATOR
Suzy T. Gluck, 1114 Pine Drive, Beverly Hills, Calif. 90210, and Jack K. Beck, 19145 Schoenbron St., Northridge, Calif. 91324
Filed May 15, 1970, Ser. No. 23,002
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D52—6

221,186
PHOTOGRAPHIC FILM PROCESSOR OR SIMILAR ARTICLE
Henry F. Hope and Stephen F. Hope, both of 195 Welsh Road, Huntingdon Valley, Pa. 19006
Filed Mar. 18, 1970, Ser. No. 21,962
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D61—1

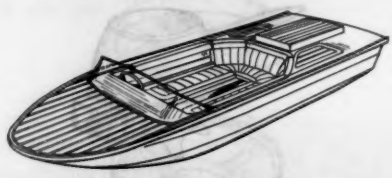


221,187
FONT OF PRINTING TYPE
Ingrid Munzberg, Kiel, Germany, assignor to Dr. Ing. Rudolf Hell Kommanditgesellschaft, Kiel Germany
Filed Nov. 10, 1969, Ser. No. 20,027
Term of patent 14 years
Int. Cl. D18—*04*
U.S. Cl. D64—12

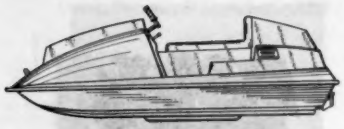
221,188
BOAT HULL
Thomas P. Daniels, Royal Oak, Mich., assignor to Seasafe Corporation, Birmingham, Mich.
Filed Jan. 13, 1970, Ser. No. 20,904
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



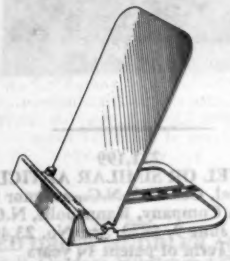
221,189
BOAT
Claudius E. Engh, 900 Donner Way, Salt Lake City, Utah 84102
Filed Jan. 29, 1970, Ser. No. 21,143
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



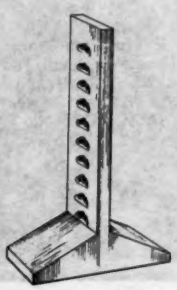
221,190
BOAT
Gerald G. Bonneson, 418 Main St., and James L. Juhl, 108 Countryview Drive, both of Hudson, Iowa 50643
Filed Feb. 16, 1970, Ser. No. 21,458
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



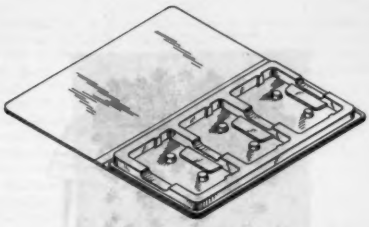
221,191
COPY HOLDER OR SIMILAR ARTICLE
Bonnie B. Nutt, 255 University Blvd., College Station, Berrien Springs, Mich. 49104
Filed Jan. 15, 1970, Ser. No. 20,941
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1



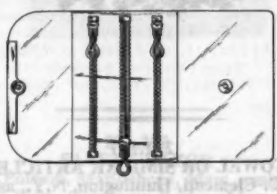
221,192
DISPLAY STAND FOR SUPPORTING STACKED CANDY BOXES
Amilcare Dogliotti, Neive, Italy, assignor to P. Ferrero & C. S.p.A., Piazza Pietro Ferrero, Alba (Cuneo), Italy
Filed Oct. 7, 1969, Ser. No. 19,446
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—9



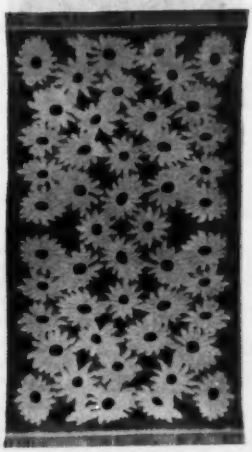
221,193
CASSETTE ALBUM
Oscar Goren, 2701 Grand Concourse, Bronx, N.Y. 10468
Filed Apr. 8, 1970, Ser. No. 22,313
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



221,194
KEY HOLDER
Charles Arthur Lee, Essex County, N.J. (187 Seymour Ave., Newark, N.J. 07108)
Filed Apr. 16, 1970, Ser. No. 22,473
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—8



221,195
TOWEL OR SIMILAR ARTICLE
Keenar A. Neel, Concord, N.C., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed June 9, 1970, Ser. No. 23,399
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D92—26



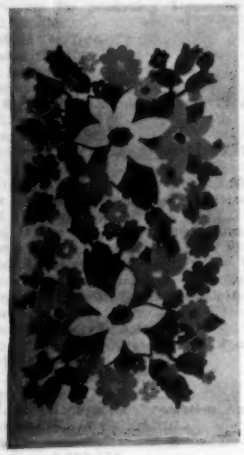
221,196
TOWEL OR SIMILAR ARTICLE
Leonard C. Clementi, Huntington, N.Y., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed June 9, 1970, Ser. No. 23,400
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D92—26

221,197
TOWEL OR SIMILAR ARTICLE
Leonard C. Clementi, Huntington, N.Y., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed June 9, 1970, Ser. No. 23,396
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D92—26

221,198
TOWEL OR SIMILAR ARTICLE
Leonard C. Clementi, Huntington, N.Y., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed June 9, 1970, Ser. No. 23,401
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D92—26

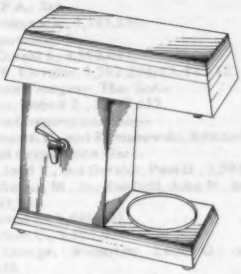
221,199
TOWEL OR SIMILAR ARTICLE
Keenar A. Neel, Concord, N.C., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed June 9, 1970, Ser. No. 23,402
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D92—26

221,200
TOWEL OR SIMILAR ARTICLE
Leonard C. Clementi, Huntington, N.Y., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed June 9, 1970, Ser. No. 23,403
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D92—26



221,201
COMBINED DRINK MUDDLER AND SIPPER
Ralph S. Gordon, 150 Beach 127th St., Belle Harbor, N.Y. 11694
Filed Mar. 2, 1970, Ser. No. 21,672
Term of patent 3½ years
Int. Cl. D7—*99*
U.S. Cl. D94—3

221,202
COFFEE MAKER
Walter R. Lorang, 2239 W. Maple Road, Walled Lake, Mich. 48088
Filed Mar. 16, 1970, Ser. No. 21,913
Term of patent 14 years
Int. Cl. D15—*12*
U.S. Cl. D94—3



221,203
SAFETY RAZOR
Norman D. Poisson, Marblehead, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Dec. 24, 1969, Ser. No. 20,638
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF JULY, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Theriault, Robert John; and Longfield, Thomas Howard, 3,592,735.

Abe, Shigeo; Furuya, Akira; and Okachi, Ryo, to Kyowa Hakko Kogyo Co., Ltd. Process for producing 5-guanylic acid nucleotides. 3,592,733, Cl. 195-28.

Abegg and Reinhold Co.: *See—*
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ACF Industries, Incorporated: *See—*
Nelson, Norman A., 3,592,263.
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Acker, William L.: *See—*
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Ackeret, Peter. Weighing scale with container storage means. 3,592,277, Cl. 177-126.

Ackley, Donald M., to Computer Communications, Inc. Web-like spring support for magnetic transducer. 3,593,330, Cl. 340-174.1

Adamec, Alfred; Leder, Roland; and Fadler, Walter, to Wiener Schwachstromwerke Gesellschaft m.b.H. Cooling means for a continuous casting mold assembly. 3,592,259, Cl. 164-283.

Adaptronics, Inc.: *See—*
Gouge, James Reid, Jr.; and Barron, Roger L., 3,593,307.

Adler, Cyrus, to Offshore/Sea Development Corporation. Hinged pipe structure. 3,592,239, Cl. 138-155.

Adler Process Corporation: *See—*
Adler, Ralph M., 3,592,374.

Adler, Ralph M., to Adler Process Corporation. Apparatus for producing a pile fabric. 3,592,374, Cl. 226-104.

Adnumat-Geralebaugesellschaft m.b.H. & Co.: *See—*
Geltermair, Hans, 3,592,135.

Aerojet-General Corporation: *See—*
Brereton, George V.; Kuntz, Robert J.; O'Brien, Charles J.; and Sjogren, Roy G., 3,591,969.

Aeropro Enterprises, Inc.: *See—*
Richardson, Benjamin F., 3,592,182.

Aerospace Industrial Associates, Inc.: *See—*
Heitfield, Vernon D., 3,592,510.

AGA Aktiebolag: *See—*
Westberg, Johan Eric Hayden, 3,592,402.

Agfa-Gevaert AG: *See—*
Kaufer, Helmut; Burger, Erich; and Huber, Hans-Peter, 3,592,542.

Agfa-Gevaert Aktiengesellschaft: *See—*
Bickl, Horst; and Pfeifer, Josef, 3,592,543.
Kampfer, Helmut, 3,592,657.
von Wasielewski, Erwin, 3,592,113.

Ahlenius, Gosta, to Broderna Lundbergs Mekaniska Verkstad AB. Hydraulic control system. 3,592,107, Cl. 91-170.

Aichenegg, Paul C.; and Emerson, Carl D., to Chemagro Corporation. Sulfoxide containing pesticides. 3,592,896, Cl. 424-337.

Aihara, Kosaku. Apparatus for the anodic oxidation of a plurality of aluminum workpieces. 3,592,754, Cl. 204-297.

Ainsworth Industries Corporation: *See—*
Buhl, Walter T., 3,592,485.

Air Reduction Company, Incorporated: *See—*
Hanks, Charles W., 3,592,955.
Shepherd, Thomas L., 3,592,622.
Shepherd, Thomas L., 3,592,623.
Wirtz, Gerald P.; and King, Robert M., 3,592,781.

Akbar, Samy. Electric motor. 3,593,051, Cl. 310-166.

Akiyama, Hideaki: *See—*
Kakiuchi, Tokusaburo; and Akiyama, Hideaki, 3,592,537.

Aktiebolaget Astra: *See—*
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Aktiebolaget Bahco: *See—*
Granlie, Jorgen, 3,591,989.

Aktiebolaget Bofors: *See—*
Theander, Olof, 3,592,808.

Aktiebolaget Svenska Kullagerfabriken: *See—*
Nilsson, Sven Walter, 3,592,072.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Stark, Richard, 3,592,078.

Alamprese, Leo, to Honeywell Inc. Pneumatic step controller with reciprocal cam means. 3,592,980, Cl. 200-81.4

Albrecht, John R.: *See—*
Stout, Ronald W.; and Albrecht, John R., 3,592,363.

Alburn, Harvey E.; and Dvonch, William, to American Home Products Corporation. 7-(1-Aminocycloalkylcarboxamido)cephalosporanic acids and related compounds. 3,592,812, Cl. 260-243.

Alden, Gardner E., to Avco Corporation. Abrasive article having a metal filler and an active filler. 3,592,618, Cl. 51-298.

Alduk, Frank P. Drop-through case packer. 3,592,002, Cl. 53-159.

Aleck, Benjamin J., to Arde, Inc. Cylindrical fluid storage and expulsion tank. 3,592,360, Cl. 222-95.

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Ottavan, Gerald J., 3,592,091.

Allen, Marion F. Elevator. 3,592,294, Cl. 187-12.

Alliance Machine Company, The: *See—*
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Gilbert, Everett E.; and Rumanowski, Edmund J., 3,592,822.

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Lohr, Thomas E., 3,591,902.
Pierce, Arleen C., 3,592,924.
Stewart, George; Winstrom, Leon O.; and Frankel, Irwin, 3,592,848.

Allied Thermal Corporation: *See—*
Hendrick, Warren R.; and Meurer, Henry J., 3,592,240.

Allinquant, Fernand Stanislas. Telescopic shock-absorbers. 3,592,302, Cl. 188-281.

Allis, Louis Company, The: *See—*
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Allis-Chalmers Manufacturing Company: *See—*
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Koranyi, Robert, 3,592,480.
Pucher, Walter; and Bachler, Sven, 3,592,988.
Pucher, Walter; Gard, Inge; and Persson, Karl Gote, 3,592,989.
Stromblad, Ingemar, 3,592,032.

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Almanna Svenska Elektriska Aktiebolaget: *See—*
Fryklund, Per, 3,592,105.

Alpan, Sadrettin; and Jappelt, Karl Alfred. Producing smokeless-briquettes from bituminous coal, sub-bituminous coal, or lignite. 3,592,617, Cl. 44-10.

Alpha Industries, Inc.: *See—*
Coraccio, Salvatore G.; and King, Philip E., 3,593,205.
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Aoki, Masatsugu, 3,593,152.

Alt, Gerhard H.; and Darlington, Walter A., to Monsanto Company. Gastropodicidal N,N'-diaralkyl dithiooxamides. 3,592,914, Cl. 424-320.

Altenschopfer, Theodor, to Henkel & Cie., GmbH. Novel rinsing agents. 3,592,774, Cl. 252-89.

Altman, Norman G. Pattern recognition system having electronically controllable aperture shape, scan shape, and scan position. 3,593,286, Cl. 340-146.3

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Ware, James Kittrell, 3,593,050.

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Evans, Ralph Henry, Jr.; and Thomas, Samuel Owen, 3,592,925.
Los, Marinus, 3,592,855.
Shu, Ping; and Barbatschi, Ferdinand, 3,592,926.

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American Home Products Corporation: *See*—
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Manning, Franklin Keith, 3,591,869.
AMF Incorporated: *See*—
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Wade, Robert M.; Hazelett, Robert M.; and Ring, Walter R., 3,593,129.
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Andersson, Arne; Klein, Hans; Tjernstrom, Ove; and Ronnevig, Car, to Allmanna Svenska Elektriska Aktiebolaget. Liquid cooled magnet coil for particle acceleration. 3,593,242, Cl. 336-62.
Ando, Ryo; Fukushima, Tutomu; Hiraguchi, Eiichi; and Hagiwara, Kokichi, to Nippon Kokan Kabushiki Kaisha. Method for refining molten metal. 3,592,629, Cl. 75-58.
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Andreasen, Mogens Myrup: *See*—
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Andresen, Raymond H., to Gits Bros. Mfg., Co. Shaft seal. 3,592,479, Cl. 277-40.
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Angeloni, John A., Sr.: *See*—
Frank, Alan I.; Angeloni, John A., Sr.; McIntyre, John J.; and Baracka, Ronald L.,3,593,284.
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Antonissen, Petrus J.: *See*—
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Aoki, Masatsugu, to Alps Electric Company, Limited. Pushbutton tuner and indicating device therefor. 3,593,152, Cl. 325-352.
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Armco Steel Corporation: *See*—
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Potts, Ralph H.; and Stalioraitis, Joseph S., 3,592,854.
Armstrong, James C. Speaker cabinet enclosure and method of making same. 3,592,290, Cl. 181-31.
Armstrong, Richard D., to Burroughs Corporation. Digital storage system having a dual-function segmented register. 3,593,298, Cl. 340-172.5
Armstrong, William H.; and Ponkey, Jack L., to Yard-Man Incorporated. Two-stage lawn sweeper. 3,591,883, Cl. 15-79.
Arneberg, Don J.; and Gribble, Joseph J., to Square D Company. Mechanical interlock for two switches that are mounted on a common support. 3,592,985, Cl. 200-50.
Arneson, Floyd D. Saw chain grinding device. 3,592,085, Cl. 76-25.
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Kosten, Richard B.; and Johnson, Ralph, to Sylvania Electric Products, Inc. Tape transport apparatus. 3,592,410, Cl. 242-192.

Kotler, Gerald R.: *See—*
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Koulopoulos, Michael A., to Honeywell Inc. Synchronous read clock apparatus. 3,593,167, Cl. 328-155.

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Kromolicki, Zygmunt, to Sterling Moulding Materials Limited. Compositions comprising a high cis graft copolymer and a high trans graft copolymer. 3,592,878, Cl. 260-876.

Krone, Martin. Knockdown table. 3,592,143, Cl. 108-115.

Kroyer, Karl K. K. Process for converting starch and other polysaccharides into dextrose and maltose containing products. 3,592,734, Cl. 195-31.

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Kryder, Roger L., to General Manufacturing, Inc. Fluorescent lamp apparatus including inverter circuit and reflector. 3,593,060, Cl. 315-219.

Kubis, Heribert, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Engine exhaust gas braking. 3,591,959, Cl. 60-13.

Kubo, Moritada; and Asano, Kuniji, to Tokyo Shibaura Electric Co., Ltd. Apparatus for determining the degree of elongation of metal strips. 3,592,051, Cl. 73-67.

Kudlaty, Walter J., to Marvel Engineering Company. Separable filter element assembly. 3,592,766, Cl. 210-232.

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Kuhn, Hans, to International Standard Electric Corporation. Oscillator system. 3,593,181, Cl. 331-12.

Kuhn, Max, to Klockner-Werke AG. Conveyor device for mining operations and associated casing support system. 3,592,332, Cl. 198-126.

Kukuminato, Tetsuo; and Ohashi, Akira. Magnet valve. 3,592,228, Cl. 137-598.

Kullenberg, Frederick W. Treatment of infections in animals with chloramphenicol solution. 3,592,933, Cl. 424-324.

Kullman, Russell M. H.; Reinhardt, Robert M.; and Frick, John G., Jr., to United States of America, Agriculture. Process for production of cellulosic materials with increased oxidizing capacity. 3,592,582, Cl. 8-115.6

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Kuntz, Robert J.: *See—*
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Kutschbach, Ernst: *See—*
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Kweller, Esher R.; Rosenberg, Robert B.; and Staats, William R., to Institute of Gas Technology. Gas burner device. 3,592,180, Cl. 126-39.

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Lamb, Ted L., to Parker-Hannifin Corporation. Quick connect couplings with selective connection means. 3,592,231, Cl. 137-614.04

Lambiris, John, to Colonial Sugar Refining Limited, mesne. Process for recovering compositions containing calcium sugar phosphates and inorganic phosphate. 3,592,770, Cl. 252-1.

La Monica, Joseph B., to Posey, John T., d/b/a Posey, J. T., Company. Restraining belt buckle with lock. 3,592,028, Cl. 70-57.

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Lanyon, Robert P.; and Boll, Carleton H., to Separation Processes Corporation. Open pit incinerating method and apparatus. 3,592,150, Cl. 110-7.

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Larikka, Leo. Tool and/or machine tool to work a hole and its flange into a wall for a branch pipe to be attached to the wall. 3,592,038, Cl. 72-325.

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Latos, Edwin J., to Universal Oil Products Company. Scorch retardant. 3,592,793, Cl. 260-41.5

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Lauriti, Umberto. Self-adjusting vise jaw. 3,592,461, Cl. 269-267.

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Lavallee, James H. Tail pipe extension silencer with venturi air extrainment. 3,592,292, Cl. 181-51.

Laverman, Royce Jay, to Chicago Bridge & Iron Company. Apparatus and method for measuring the thermal conductivity of insulating material. 3,592,060, Cl. 73-15.

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Leffert, Charles B.; and Hafstad, Lawrence R., to General Motors Corporation. Brake heat pipe cooling. 3,592,298, Cl. 188-71.6

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Lempert, Joseph; and Kotler, Gerald R., to Westinghouse Electric Corporation. Gettering arrangements for vacuum-type circuit interrup-

ters comprising fibers of gettering material embedded in a matrix of material of good conductivity. 3,592,987, Cl. 200-144.

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Leonard, George E., to Kartridge Pak Co., The. Apparatus for placing aerosol valve assemblies in aerosol containers. 3,591,912, Cl. 29-208.

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Le Vasseur, Arnold P.; and Roen, Randolph P., to Minnesota Mining and Manufacturing Company. Apparatus for heat shrinking tubing about objects. 3,591,890, Cl. 18-4.

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Lewis, Henry B. Tractor-trailer brake system. 3,592,315, Cl. 192-3.

Lewis, James W. Reciprocating and oscillating tool plate machine. 3,591,913, Cl. 29-208.

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Link, William J.; and Pohland, Hermann W., to Du Pont de Nemours, E. I., and Company. Dyeing continuous filament nylon with 1:1 premetallized dyes and mixtures thereof with dye assistants. 3,592,584, Cl. 8-26.

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List, Heinz. Machine for processing powder or paste-like materials into a granulate or the like. 3,592,129, Cl. 100-157.

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Los, Marinus, to American Cyanamid Company. 1-Octahydro-8β-(t-butoxy or benzyloxy)-8aβ- lower alkyl-2(3H)-phenanthrones. 3,592,855, Cl. 260-586.

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Piroutex, Miroslav J., to Self-Matic Valves Corporation. Fittings for anchoring pilot air conduit in operational positions. 3,592,441, Cl. 251-364.

Plant, Anthony Brian, to Lucas, Joseph, (Industries) Limited. Polyphase electric motor control system for speed and direction of rotation. 3,593,079, Cl. 318-202.

Plantelakis, Thomas; and Nye, Dudley D., Jr., to Borg-Warner Corporation, mesne. Motor control system with control amplifier stage having anti-undershoot circuit. 3,593,088, Cl. 318-345.

Platz, Rolf; and Baur, Karl Gerhard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Recovering bromine and iodine from reaction products of oxydehydrogenations. 3,592,600, Cl. 23-216.

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Ploughman, Leonard K., to Atwood Vacuum Machine Company. Vehicle door latch. 3,592,496, Cl. 292-216.

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Polak, James C., to General Motors Corporation. Hydromechanical transmission. 3,592,077, Cl. 74-687.

Pollitzer, Ernest L., to Universal Oil Products Company. Multiple stage hydrocracking process. 3,592,759, Cl. 208-89.

Pollitzer, Ernest L., to Universal Oil Products Company. Ethylene-producing process. 3,592,867, Cl. 260-683.

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Pool, Stuart D.; Svereika, Edward; and Findlay, Jack B., to International Harvester Company. Control system for tree shaker apparatus. 3,592,073, Cl. 74-471.

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Porath, Gordon H., to Babcock & Wilcox Company, The, mesne. Work follower rests. 3,591,987, Cl. 51-105.
Porret, Daniel, to Ciba Limited. N,N'-Diglycidyl compounds. 3,592,823, Cl. 260-309.5
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Posey, John T.: *See—*
La Monica, Joseph B., 3,592,028.
Potter, Fred S.; and Maxson, Walter H., to Da-Lite Screen Company, Inc. Automatic tensioning bar for portable picture screens. 3,592,255, Cl. 160-24.
Potts, Ralph H.; and Stalioraitis, Joseph S., to Armour Industrial Chemical Company. Hydrolysis of amides to amines. 3,592,854, Cl. 260-583.
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Price, Ralph E., to Litton Industries, Inc. Work rest. 3,591,988, Cl. 51-105.
Prichard, William W., to Du Pont de Nemours, E. I., and Company. Pharmaceutical compositions and methods of controlling influenza a virus infection utilizing substituted adamantanes and tricyclo [4.3.1.1³,8] undecanes. 3,592,934, Cl. 424-325.
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Pucher, Walter; Gard, Inge; and Persson, Karl Gote, to Allmanna Svenska Elektriska Aktiebolaget. High voltage circuit breaker with pressurized breaking chamber of low liquid type. 3,592,989, Cl. 200-150.
Pumpe, Gerhard, to Siemens Aktiegesellschaft. Method and apparatus for the recognition of errors at the receiver in a data transmission system. 3,593,275, Cl. 340-146.1
Pumpe, Gerhard, to Siemens Aktiengesellschaft. Method and circuit therefor for evaluation of received coded messages. 3,593,279, Cl. 340-146.1
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Sakaguchi, Mitsuhito; and Nishida, Nobuo, to Nippon Electric Company, Limited. Analog to digital converter with graphic display employing holographic techniques. 3,593,029, Cl. 250-219.

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Samatov, Jury Petrovich; Goldin, Mikhail Davidovich; Tarakanov, Evgeny Ivanovich; Emelyanenko, Vladimir Vasilievich; Kaviarov, Ivan Savvateevich; and Malchikov, Vladimir Sergeevich. Transmission gearbox, preferably for use in a tractor. 3,592,080, Cl. 74-740.

Sampson, Robert W., to Universal Oil Products Company. Analogue integration apparatus with compensation for drift. 3,593,010, Cl. 235-183.

Sandbank, Carl Peter; and Thomas, David Lane, to International Standard Electric Corporation. Communication system including a pluralty of semiconductive circuit arrangements using Gunn effect devices. 3,593,046, Cl. 307-299.

Sandor, Bela, to General Motors Corporation. Dual-action tailgate. 3,592,504, Cl. 296-50.

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